PHILADELPHIA, OCTOBER 22, 1881.

ORIGINAL LECTURES.

ABSTRACT OF AN ADDRESS MADE BEFORE THE ACADEMY OF NATURAL SCIENCES, BY DR. H. C. WOOD, ON THE NATURE OF THE DIPHTHERITIC CONTAGIUM.

THE lecturer began by stating that the researches which formed the basis of the present address had been made under the auspices, and, indeed, at the suggestion, of the National Board of Health, by Dr. Henry F. Formad and himself, who were jointly responsible for the facts and inductions and jointly deserving of whatever reprobation or approbation might be due. The full text of the work is now in the hands of the National Board, and will be shortly published by them; and the lecturer desired that criticism be withheld until this was done, as the memoir will contain much that cannot be spoken of in the present lecture.

In the spring of 1880 work was begun by inoculating rabbits with diphtheritic membrane taken from the throats of patients at Philadelphia. An account of the labors of the following summer has been already published, but it seems necessary to epitomize them here. It was found that only in a very few cases was anything like diphtheria produced in the rabbit by inoculating with the membrane. The inoculations were practised by putting pieces of the material sometimes under the skin, sometimes deep in the muscles. Many rabbits died after some weeks, not of diphtheria, but of tuberculosis. In a series of experiments it was shown that this tuberculosis was an indirect and not a direct result of the inoculation, and that any apparent relation between the two diseases is only apparent, not real. Next, the tracheas of a series of rabbits were opened and false membrane inserted. It was found that under these circumstances a severe trachitis was frequently produced, and was attended by an abundant formation of pseudo-membrane. Careful studies made of the false membrane of diphtheria and of this false membrane showed that the two were identical, both containing in abundance fibrin fibres, corpuscular elements, and various forms of micrococci. To determine whether other inflammations of the trachea than that caused by diphtheria or its membrane are accompanied by the formation of false membrane, a number of experiments were made, and it was demonstrated that the production of false membrane has nothing specific in it, but that any trachitis of sufficient severity is accompanied by this product. Careful studies also showed that this false membrane does not differ in its constitution from that of true diphtheria, except it be that the micrococci are not so abundant in it. We always found some micrococci, and in some of these traumatic pseudo-membranes they were almost as numerous as in the diphtheritic exudation.

Last spring we resumed our investigations. Having heard that there was a very severe epidemic in Ludington, Michigan, Dr. Formad was despatched to examine cases and collect material. He found a small town situated upon the shore of Lake Michigan, in the centre of the lumber region, with inhabitants mostly engaged in the lumber-trade and in managing very numerous large saw-mills. The town was all built upon high ground except the Third Ward. This occupied a low swamp which had been filled in largely with sawdust. The soil was so moist that a hole dug in it would fill at once with water, and but few houses had any attempts at cellars. It was in this district that the disease had prevailed. Almost all the children had had it, and one-third of them were said to have died. Dr. Formad examined a large number of cases, obtained a supply of diphtheritic membrane, and brought home pieces of the internal organs of a child upon whom he had made an autopsy. In every case the blood was found more or less full of micrococci, some free, others in zoogloea masses, others in the white blood-corpuscles. The organs brought home also all contained micrococci, which were especially abundant in the kidneys, where they formed numerous thrombi, choking up and distending the blood-vessels. In the summer of 1880 we examined the blood of several cases of endemic Philadelphia diphtheria, and in no case found any new elements in it. But during the present summer we have found micrococci in the blood of Philadelphia diphtheritic patients, show-

ing the differences in the disease are simply in degree, not in kind.

Experiments were now made with the Ludington material upon animals. Inoculations were practised under the skin, deep in the muscles, and in the trachea. In all cases the results were similar. A grayish exudation appeared at the seat of inoculation, along with much local inflammation, the animal sickened, and in the course of a few days death occurred. The local symptoms increased and widened. In some cases the false membrane spread from where the poison had been put in the trachea up to the mouth. The blood examined during life or after death was found to contain micrococci precisely similar to those found in the Ludington cases, and in a few instances micrococci were found in abundance in the internal organs. Studies made upon the blood of these animals, as well as upon the Ludington cases, show that the micrococci first attack the white blood-corpuscles, in which they move with a vibratile motion. Under their influence the corpuscles alter their appearances, losing their granulations. They finally become full of the micrococci, which now are quiescent and increase until the corpuscle bursts and the contents escape as an irregular, transparent mass full of micrococci, and form the so-called zooglœa masses. In the diphtheritic membrane the micrococci exist frequently in balls, and it is plain that these collections are merely leucocytes full of the plant. The bone-marrow of the animals was found full of leucocytes and cells containing micrococci.

The question now arose, is the disease produced by diphtheritic inoculation in the rabbit diphtheria? We concluded that it is, because the poison producing it is the same, the symptoms manifested during life are the same, and the post-mortem lesions are identical. The contagious character of the disease is retained, as we succeeded in passing it from rabbit to rabbit.

Our next series of experiments were directed to determining whether the micrococci are or are not the cause of the affection. The experiments of Curtis and Satterthwaite, of New York, have shown that the infectious character of diphtheria depends upon its solid particles; for when they filtered an infusion of the membrane it became less and less toxic in proportion as the filtration was more and more perfect; and when the infusion was filtered through clay, the filtrate was harmless.

The urine of patients suffering from malignant diphtheria is full of micrococci, and may contain no other solid material. Following the experiments of Letzerich, we filtered this urine and then dried the filter-paper. Upon experiment we found this even more deadly in its effects than is the membrane. The symptoms and lesions following in the rabbit inoculation with such paper are precisely those which would have ensued had a piece of diphtheritic kidney or membrane been employed. This experiment shows that the solid particles of the membrane, which are the essential poison of malignant diphtheria, are the micrococci, which must be either the poison itself or the carriers or producers of the poison.

Leaving for a while this point, I will next direct your attention to our culture-experiments. These were performed in the manner commended by Klein and that recommended by Sternberg. The first method seems to us the best for the purpose of studying the development of the micrococcus itself; the second, the best for the obtaining of it in quantity for experimentation.

We cultivated micrococci from the surface of ordinary sore throats, from furred tongue, from cases of mild diphtheria as we commonly see it in Philadelphia, and from Ludington cases. We found, in the first place, that there were no differences to be detected in the general or special appearance of the various micrococci, and no constant differences in size. We found that they all formed similar shapes in the culture-apparatus; they had this difference, however,—whilst the Ludington micrococci grew most rapidly and eagerly generation after generation up to the tenth, those from Philadelphia diphtheria ceased their growth in the fourth or fifth generation, whilst those taken from furred tongue never got beyond the third transplantation. Various culture-fluids were used, but the results were identical. We conclude, therefore, that as no difference is detectable between the micrococci found in ordinary sore throat and those of diphtheria, save only in their reproductive activity, they are the same organisms in different states. As the result of some hundreds of cultures, we believe that the vitality under artificial culture is in direct proportion to the

malignancy of the case from which the plant has been taken.

We next made a series of experiments of inoculating rabbits with cultivated micrococci, and succeeded in producing diphtheria with the second generation, but never with any later product. This success, taken in conjunction with the urine experiments already spoken of, seems to us sufficient to establish the fact that the micrococci are the *fons et origo mali* of diphtheria. The experiments of Pasteur and others have proven that it is possible for an inert organism to be changed into one possessed of most virulent activity, or *vice versâ*, and we believe that we can offer direct proof that the micrococci of the mouth are really identical in species with the micrococci of diphtheria, and do not merely seem to be so. We exposed the Ludington membrane for some weeks to the air in a dried condition. There was no putridity or other change detectable in it; but, whereas formerly it had been most virulent, now it was inert, and its micrococci not only looked like those taken from an ordinary angina, but acted like them. They were not dead, they had still power of multiplication, but they no longer grew in the culture-fluid beyond the third or fourth generation. Certainly they were specifically the same as they had been, and certainly, therefore, the power of rapid growth in culture-fluids and in the body of the rabbit is not a specific character of the diphtheria micrococcus.

As is well known, Pasteur attributes the change from an active to an inert organism to the influence of the oxygen of the air upon the organism. Whether this be true of the diphtheria micrococcus is uncertain, but the effects of exposure of the dried membrane seem to point in such direction.

With the facts that are known in regard to the clinical history of diphtheria and those which we have determined in our research, it is easy to make out a theory of the disease which reconciles all existing differences of opinion and seems to be true.

A child gets a catarrhal angina or trachitis. Under the stimulation of the inflammation products the inert micrococci in the mouth begin to grow; and, if the conditions be favorable, the sluggish plant may be finally transformed into an active organism, and a self-generated diphtheria results. It is plain that if this be correct there must be every grade of case between one which is fatal and one which is checked before it fairly passes the bounds of an ordinary sore throat. Every practitioner knows that such diversity does exist. Again, conditions outside of the body favoring the passage of inert into active micrococci may exist, and the air at last become well loaded with organisms, which, alighting upon the tender throats of children, may begin to grow and themselves produce violent angina, trachitis, and finally fatal diphtheria.

In the first instance we have endemic diphtheria as we see it in Philadelphia; in the second, the malignant epidemic form of the disease as it existed in Ludington. It is also apparent that in the endemic cases the plant whose activity has been developed within the patient may escape with the breath, and a second case of diphtheria be produced by contagion. It is also plain that as the plant gradually in such a case passes from the inert to the active state, there must be degrees of activity in the contagium, one case being more apt to give the disease than is another; also that the malignant diphtheria must be more contagious than the mild endemic cases. We think there is scarcely a practitioner who will not agree that clinical experience is in accord with these logical deductions from our experimentally-determined premises.

It yet remains for us to investigate as to what are the conditions outside of the body which will especially favor the production of active micrococci, and also to study the effects of agents in killing these organisms; for it is very apparent that local treatment of the throat must often be of the utmost importance, and that it will be far more effective if it be of such character as to kill the micrococci, and not simply be antiphlogistic in its action.

Chloral Hydrate in Toothache.—Dr. Spörer recommends that three to four lumps of hydrate of chloral (0.03–0.06 gramme) should be inserted into the hollow and painful tooth, the chloral being allowed to dissolve. He has treated thirty-eight cases successfully in this way, and has also obtained good results in several cases of hemicrania resulting from carious teeth.—*St. Petersburg. Med. Wochenschrift*, No. 35, 1880; *Centralblatt f. Chirurgie*, December 11, 1880.

ORIGINAL COMMUNICATIONS.

THE APPLICATION OF STATIC ELECTRICITY TO MEDICINE.

Read before the Philadelphia County Medical Society, September 28, 1881,

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THE electrical phenomena attendant on thunder-storms were doubtless theorized upon, if not critically studied, by learned men in the earliest periods of history; but not until 600 B.C. did Thales of Miletus, one of the seven wise men of Greece, discover that amber, when rubbed, produced a new force capable of attracting and repelling light bodies, such as the pith of elder. He curiously inferred from this that it possessed a soul which was nourished by absorption of mysterious essences contained in the attracted substances, which were then violently repulsed as unworthy of further association. The word electricity was coined from the Greek ἤλεκτρον, "amber," by Dr. Gilbert, of Colchester, physician to Queen Elizabeth of England, who published a book in A.D. 1600, entitled "De Arte Magnetica," in which magnetic and electric phenomena were skilfully handled. The earliest known machine for generating the subtile fluid was constructed by Otto von Guericke, a burgomaster of Magdeburg, the chief city of Prussian Saxony, whose work, "Experimenta Nova Magdeburgica," published in 1672, describes it as being a sphere of sulphur rotated on an axis and rubbed by a cloth or cat-skin pressed on it by the hand. In 1709 a glass cylinder rubbed by the dry hand was substituted for the sulphur globe by Hawksbee, of London; and twenty years later Grey, a pensioner at the Charter-House, and Wehler, transmitted electricity from one point to another, and distinguished conductors from non-conductors. From 1733 to 1765 Dufay showed the identity of electrics and non-conductors and non-electrics and conductors, and discovered the two kinds of electricity, vitreous and resinous, whilst Boze, a professor at Wittenberg, adapted the prime conductor, and Winkler, of Leipsic, added the fixed cushion. In 1746 the Leyden jar was invented by Muschenbroek, of Leyden, on the old Rhine, near Rotterdam, Holland; but a rich burgomaster, Cuneus, of the same town, and Kleist, canon of the cathedral of Kamin, in Pomerania, also claim the honor. The machine was greatly improved by the addition of the jar or condenser, which accumulates and holds for a time large quantities of electricity of low potential, which, in the limited field of the jar, the old scientists spoke of as *bound*, to distinguish it from the *free* field of the open air. In 1752 the famous kite experiment of Franklin proved the identity of lightning and statical electricity; and as I was taught at the University of Pennsylvania that the favorite ground of the philosopher whilst thus experimenting was that recently occupied by the building of my alma mater, and understand that the same claim is now held for the locality of our *confrères* at the Jefferson Medical College, I have by investigation reconciled these momentous theories by definitely ascertaining the true locality at which the cloud-spark was brought to earth as being a few feet northeast of the intersection, as it now stands, of Locust and Thirteenth Streets,—the foresight of our illustrious townsman in selecting this favored spot in view of its classic associations of to-day being equalled only by the universal adaptation of electricity to the scientific and popular wants of the wide world.

In 1768, Ramsden invented the plate-machine, which was gradually improved from time to time, the best form of this class now extant being that of Winter: the Carres and Bertsch dielectric apparatus also holds a high position. The most important modification, however, was the production, by Holtz, of Berlin, in 1865, of his celebrated instrument, in which cushions are discarded, the loss by friction being thus reduced to the minimum, quantity much increased; and through it the study of static electricity has been greatly facilitated. A very recent addition to this fine apparatus has rendered it as nearly perfect for medical purposes as our present knowledge would lead us to expect. The acme of perfection in machines for experimental illustration is reached in the magnificent development by Van Marum, of Holland, now exhibiting at Paris.

To retrace a little. Galvani, in 1786, discovered the constant current, galvanism, it being further investigated by Volta, who devised, in 1799, the Voltaic pile; and Faraday, in 1837, published his researches on induction currents, from which,

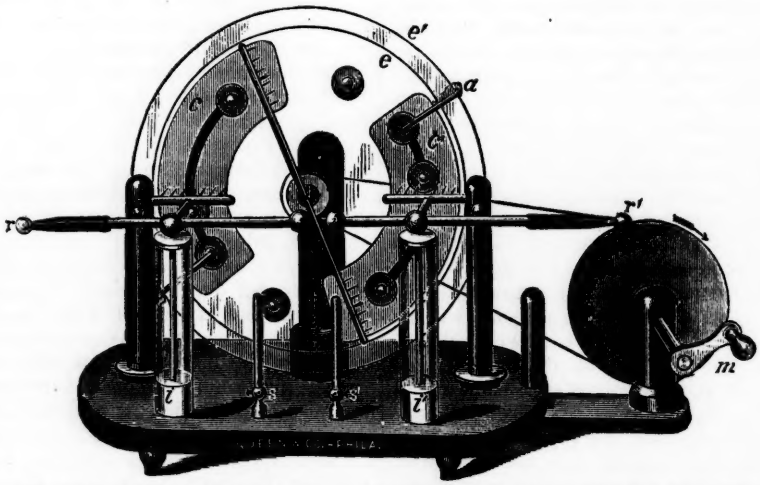
through electro-magnetism, such marvellous effects have been attained in the intercommunication of printed and articulate speech, in electric lighting, and in hundreds of applications to the arts and sciences, many of which are either mysteries to the public or even unknown. Seebeck, in 1821, discovered thermo-electricity; and the varieties referred to, with magnetism, bring this brief sketch of electrical history up to date, much interesting material being necessarily passed by from lack of time in which to consider it.

In the early days of therapeutics, charms, incantations, mesmerism, and like mummery occupied a considerable share of credit with the people, and by natural descent (or ascent) this plan of gulling their patrons has been inherited by the homœopathic fraternity, whose power over the imagination of their dupes is alike widespread and incomprehensible. It is to be hoped that the tendency on the part of certain so-called popular or fashionable physicians in regular practice to pander to the lassitude of brains in many of their wealthy patients, by leaning towards such jugglery as is evident at present, will be promptly and decidedly frowned down. In the olden time the occult electrical force was freely used by physicians of all schools, empirically at best; yet cures apparently marvellous are reported as having thereby been worked in cases otherwise unmanageable. The principles upon which rational medicine were based as they became better understood assigned static electricity to a legitimate and not by any means narrow field, in which, through the instrumentality of skilful men, much good was then and is now done; and had it not been for inherent difficulties in its application, which were not overcome until lately, its usefulness would at this time have been more widely known, and it would have been more generally employed. For reasons hereafter stated, the increasing use of galvanism and faradism in nervous disorders threw static electro-therapeutics into the shade; and, with very few exceptions indeed, those gentlemen who employ electricity at present in practice have paid no attention whatever to this branch of the subject. That static electricity, properly used, possesses great value is beyond question, the evidence of eminent practitioners, especially in Europe,—as Wilks, of England, Clemens, of Germany, Sewanda, of Austria, Vigoreux, of France,—proving the correctness of this statement. For nearly thirty years past I have been interested in general electrical studies, and from 1866 the subject of electro-therapeutics has occupied much of my time. Having during this period given special attention to static electricity, despite the disadvantages surrounding its successful use, I hope the effort to awaken a new interest in it will not be felt as an undue trespass upon your attention. As this form of electricity was formerly much used in therapeutics, yet was discarded until lately, there must have been some reason for its abandonment; and, briefly stated, the discouraging efforts to obtain uniform results from even the higher-class machines of to-day are such as to require more interest and patience than most practitioners command. In damp weather they work feebly or not at all; and the effort to remedy this defect by the isolation of the machine in air-tight cases with contained vessels of calcium chloride, anhydrous phosphoric or sulphuric acid, etc., have failed long ago. The refusal to act does not always depend on dampness, but at times the electrical atmospheric and earth tension is so low as to render the best apparatus difficult to start. The high cost of the instrument was also an impediment, and this being true of the carefully-made modern apparatus made the use of the less perfect mechanism in the past impossible. Within a short time past the Holtz has been modified by Toepler, of Riga, and also by Voss; and Messrs. James W. Queen & Co., of this city, have still further improved it, the result being a machine with which static electricity is produced in large quantity and high tension, the sparks being quite dense and very long in proportion to the size of the instrument. It works admirably in almost every atmospheric condition, even when sprayed with water, and is moderate in price. When ordinary machines will not work and this is sluggish, a few sparks from a Ruhmkorff coil will charge the armatures and insure perfect action. Those who take interest in experimental work in this direction have now at their command an exceedingly handsome and valuable apparatus.

With the advent of Queen's Toepler-Holtz, the relative value of the different forms of apparatus is equalized; indeed, in some respects the static machine has

superior claims. In the hands of competent persons it is not so difficult to keep in order as galvanic and faradic instruments, and it costs nothing to run when driven manually; and an exceedingly perfect electric motor can now be had which rotates it at a cost so moderate as to be virtually disregarded,—the battery also, as arranged by myself, furnishing a galvano-caustic current, if desired, of sufficient quantity for ordinary office purposes. Dynamic apparatus, on the contrary, is continually burning up zinc in proportion to the demand made upon it. The faradic inductorium furnishes one kind of current only; the static furnishes one not to be distinguished from the former in its nerve- and muscle-effects, and has additionally qualities of value *per se* not possessed by faradism. The static machine furnishes direct and induced high-tension currents, either and both of which are of immense value in varied phases of disease, and which are preferable to drugs in many instances.

The assertion has lately been made that, although the term "induced current" is admissible for convenience of expression, no true induction takes place; but, as a current may be had by attaching the conductors to the outside foil of the condensers,—one to each,—with the connection broken between them by a switch, as in my own machine, or by removing the chain or wire as ordinarily found, the energy developed on the plates is transferred to the inner coating of the jars only; and the fine and almost painless current thus obtained is really an induced one, precisely as the secondary is in the faradic coil. The strength is regulated by adjusting the discharging-rods as in the ordinary use of the machine.



The machine illustrated consists of a stationary adjustable back plate and a revolving front plate. When put in motion, a small quantity of the electricity generated on the revolving plate is taken from the small metallic disks by brushes on the arms, *a a'*, and transferred to the armatures, *c c'*, on the back plate. This plate, when charged, reacts upon the revolving plate by induction, and electricity is taken therefrom by combs on the horizontal cross-arms, and passes by spark between the discharging-rods, *r r'*. When the condensers, *i i'*, are removed, the flow is continuous and of low tension; when they are in position, as represented in the cut, the discharge is in high tension, the sparks being smaller and more rapid, as the sliding-rods, *r r'*, are near each other, and slower and denser, the greater the separation of the balls. The vertical cross-arm equalizes the charge on the revolving plate, and prevents the carrying of the positive charge to the negative inductor, and the negative to the positive. The arm should connect the upper left-hand disk with the lower right-hand disk of the armatures on the main plate. The revolution is (on the upper edge) from left to right. Charges of great quantity can be had through one or more Leyden jars, the potential being regulated by the size and number of jars employed.

With the desire to interest the profession, if possible, in the value of static electricity, and to aid in even a slight way in rescuing it from undeserved oblivion, I wrote, last January, a short paper for the *Medical and Surgical Reporter* on the subject; but unseen delay, through the loss of an electrotype cut, prevented its publication till March 12, when it was followed by a series in the *New York Medical Record*, by Dr. Morton, of that city. Subsequently other articles have appeared, both

in domestic and in foreign journals; and it is to be hoped that practical results superior to those obtained heretofore will be secured by static electricity in the much better light thrown upon obscure nervous diseases by the present race of great pathologists than was possible in the past, under less advanced teaching.

In a paper on "The Treatment of Dysmenorrhœa by Electricity," which I had the honor to read before this Society at its first meeting in the autumn of 1880, the following sentence occurred: "A most valuable but neglected method in neuralgia, not alone of uterine origin, but of all types, is the use of *static* electricity from the Holtz or Bertsch machine, which will often succeed after failure of all other proceedings."

A few cases in illustration of its value are now briefly given.

A. B., a case of melancholia persistent for four years, intensifying periodically without apparent cause, in all except the mental state well developed and healthy, habits regular, and not at any time hysterical or excitable. She had received medical treatment for more than three years from different physicians without perceptible benefit, including a brief residence in a private asylum. The circumstances of the family prohibited change of scene, which with new associations might have been of service. Drugs failing, she was referred to me for electrical treatment, her physician being glad to drop the case. I put her on general faradization four times a week, with some benefit after a month's trial, but, not being satisfied myself, I substituted static electricity, and her improvement in another month was decidedly greater, and then she was at times not only cheerful, but her interest in surrounding affairs was noticeable to her associates. This method of treatment, without any auxiliary, in four months did more towards recovery than all former plans combined, and so far the improvement is permanent. She was treated by simple charging when insulated tri-weekly, the condition being maintained for half an hour at each time, and, although to my mind she is yet abnormally depressed at times, she is in every way better, and her friends consider her recovery perfect, which opinion, after all, is in more ways than one weightier with the neighbors than mine. Her last physician, an extremely polite gentleman, agrees with the family: hence I concede the verdict and consider her cured.

O. D., a case of well-defined epileptiform hysteria, originating in congested irritable ovaries. Her suffering was intense before and during menstruation, and more or less decided paroxysms were obtainable through pressure upon the ovaries at any time. I put her at once upon static electrical treatment, applied generally and with special attention to the foci of irritation. The sittings were tri-weekly, occasionally daily, and in two months she was marvellously improved, to quote her mother's words. Very decided pressure upon the hysterogenic regions now failed to discompose her, or at most precipitated mild reflex results, and only a day or two ago I noticed how particularly bright and cheerful she was as compared with her condition when I first met her. Nothing in the way of drugging by myself was done during the time mentioned, and the Hoffmann's Anodyne, elixir of valerianate of ammonia, musk, and other antispasmodics which had been relied upon previously in domestic practice were withdrawn totally when she came into my charge. This young lady is a type of thousands of such cases which are the bane of many physicians, and she would with some have run a risky race in the direction of oöphorectomy, the prevalent panacea for such unfortunates. I have every reason to expect a perfect cure in her case; and if decided relief or cure can be successfully looked for by this method in even a fair percentage only of these melancholy girls thus afflicted, it would warrant those dealing largely in nervous diseases to investigate this plan of treatment thoroughly.

Mrs. H. suffered for several years with periodical trifacial neuralgia, which was intensified during menstruation, at which time ovarian neuralgia was usually added. She presented no cause in the way of imperfect teeth, indigestion, or depraved secretory action, nor did her social position expose her to cold or wet. Quinia, iodoform, belladonna, morphia, and other drugs had been exhausted without other than temporary benefit to the face symptoms and none to the ovarian. She came to me for electrical treatment, and had thorough galvanic applications locally, with general faradization. Although her strength and nutrition were improved, the paroxysms were apparently merely shortened when present and somewhat delayed, and after a fair trial I became dissatisfied with the progress, which would, doubtless, if persisted in, have ultimately cured her as it has done others; but, in view of a trip to Europe, I wished, if possible, to finish the case prior to her departure. She came to see me one afternoon when suffering considerably with supra-orbital pain. I had been working with my Holtz, rehearsing some experimental illustrations for a lecture, and, to amuse her while the constant battery was being set up (it having been disconnected for recharging just before she entered), I electrified her pretty thoroughly, and drew sparks from the brow and temple for some minutes, with the effect of completely removing the pain before she left the chair. Both constant and induction currents have done the same thing for me repeatedly, with others, but not in her

case. She became enamored of the new battery, and I complied with her request to further test its merits, with the result of permanently relieving her trouble before she left the city. The method employed was to charge her and draw sparks from the affected regions with the knuckles or a wire brush. She had tri-weekly treatment of all applications, but a dozen sittings under static electricity did more for her than treble the amount of the others separately or combined, and she has remained well. Had she not been cured before her European tour, either the voyage or some Continental physician would have got the credit, for she was nearer well than I thought at the time the static electricity was commenced.

Mr. McC., an old patient of mine, had been gradually growing worse from intercostal pain laterally over the fifth rib, always constant, but with exacerbations at irregular intervals, and usually worse at night. There was no discoverable cause, yet he became daily poorer in weight and general appearance, despite tonics and good feeding. Neither galvanism nor faradism was of service; his only resort was anodynes, but he disliked as much as myself to push them. With the good result of the preceding case in memory, I got his consent to try the Holtz, although he had no faith whatever in electricity. He got better from the first trial, and in three weeks was a different-looking man. In addition to drawing sparks from the seat of pain, which was circumscribed and small in area, I discharged a small Leyden jar at the centre of the painful region at each sitting, and finished the *séance* by thoroughly charging him and allowing the charge gradually to escape without drawing it by spark. Two months of treatment relieved him completely, without any assistance from medication. It is true that at long intervals he has slight twinges, but they are momentary, and no painful spot is now discoverable on pressure, as at first. My opinion for some time was that an exostosis existed at some internal point along the rib, which produced the peripheral pain through pressure on the intercostal nerve, and that he was therefore incurable; but the result of treatment disproved this idea. He had no syphilitic, gouty, or rheumatic diathesis, and nothing apparently chargeable to the sympathetic, and I am still at a loss to account for the causation of his suffering. I am inclined from experience to attach considerable value to the so-called "positive charge" of Radcliffe, as here practised, in deficient nerve-tone, it holding much the same relation as general galvanization or general faradization in bracing up neurasthenic patients.

H. R., a youth of seventeen, who previously enjoyed excellent health, became affected during the winter of 1879 with neuralgic pain of the left testicle, cord, and perineum. The suffering at times was very great, especially in, as he thought, the lower part of the rectum, which, however, I ascribed to the vesiculæ seminales, or some point in the cord as it approached the veru montanum. Upon investigation, I was convinced that the trouble arose from masturbation, the semen being prevented from escaping by pressure over the urethra at the anal region, which possibly had produced distention of the duct near its emergence into the urethra. At any rate, he was alarmed at his condition, and relinquished his fault; yet the pain was persistent. He was kept on full doses of the bromides to allay excitement of the genito-urinary tract, and suppositories of belladonna were used at bedtime, with camphor and lupulin. Progress, though present, was slow, and, after being satisfied of his good faith in avoidance of masturbation, and the suffering being evidently neuralgic, I put him on static electricity, without trying either the coil or constant battery, and discontinued the medicine. Improvement was decided from the first, and a couple of months only passed prior to an entire cure. My object in adopting this form of electricity was purely experimental, because, as stated in several published papers, my uniform habit in urino-genital cases is to apply galvanism. He has had no return of the pain at any time.

I have seen each of these cases since writing this paper, and they all remain well. Some of them are of long standing; and the result may therefore be taken as permanent. I regret the constrained brevity of the report; but time will not admit of more extended remark.

In reporting these cases, selected from a number, I have no desire to deprecate other forms of electricity in neuralgia or similar phases of nervous disease. My experience with galvanism particularly confirms daily the high position it of necessity occupies when scientifically handled, and, although not an unqualified endorser of Duchenne in his estimate of faradism as equal in all respects to galvanism, I know how valuable it is; but my purpose in bringing before the profession the claims of static electricity is simply to do justice to an agent almost forgotten, yet of great value in a wide field, and one which has the additional advantage of being easily manipulated under improved forms of mechanism, agreeable to the patient, safe in its application to points demanding great caution with the pile, and especially in brow-neuralgias, in which faradic currents are obnoxious to many people.

One great advantage to diffident persons

is that little or, if chosen, no clothing need be removed, as applications can be effectively made through the dress without any danger of damage to the most delicate or costly fabrics, and this cannot be done with dynamic electricity. The patient should generally be insulated on a small platform two feet or more square, which may be home-made by using glass or porcelain knobs, one pole connected with the chain or patient, the other grounded, and the machine then set in motion. Brass chain No. 16, encased in black rubber tubing, I prefer for conductors; but handsome braided silk cords may be had from the makers if chosen. An insulated ball or pointed electrode, also grounded by wire or chain, is then approximated to the person of the patient, when the flow will be diverted almost wholly to the point selected. The charge escapes from every part of the surface, more or less, but particularly from angles or projections, as the elbows, knuckles, knees, face, and hair, creating a sensation as though air was smartly blowing upon the cuticle. The electrode being held at from four to six inches from the body produces this "wind" decidedly at the underlying point. At two to three inches a line or brush of delicate rose-colored or violet light (the "aigrette" of the French) is seen, and closer application short of actual touching develops dense disruptive discharges in the form of bright white sparks, slightly blue-tinted, as are all electrical flashes, however produced. The blue tinge is probably due to incandescent nitrogen. The silent or "aigrette" discharge is, with the so-called "wind," pleasant and painless; the spark is more or less sharp according to its tension as produced by rapid rotation of the machine or concentration by Leyden jars, single or in battery. The current may also be taken from the discharging rods direct, from the inner foil of one condenser and the outer of the other, as done by Dr. Bartholow, or, as before stated, the induced static current as devised by Dr. Morton, of New York, is had from the outer surfaces only of the condensers, they being separated from each other, yet attached by the inner foil only to the collecting combs. The "aigrette" can also be had by attaching the cords to the rods and removing the condensers. A method which I frequently use is to disconnect the condensers, attach a cord to the outside of either (the positive being the stronger), and with a suitable electrode apply the current, the patient not being insulated. This method has not, to my knowledge, been before described, and it is at once simple and efficient. In whatever manner used, the electrometer should be employed to properly graduate the current, Pelletier's being the best instrument for this purpose.

Time forbids extended reference to phases of disease which have been overcome by static electricity or in which we may reasonably expect good results. In my own experience of particularly the last ten years, excellent success has been had in varied neuralgias, in hyperæsthesia and anæsthesia, in one case of paralysis agitans, which, though of course incurable, was materially benefited, in chorea, hysterical aphonia, stubborn dyspepsia, constipation, dysmenorrhœa and amenorrhœa, myalgia, and the weak back of school-life, in insomnia, highly so in pain of many descriptions, but particularly in that of gouty joints. The objection that static electricity accumulates only upon the skin is not strictly true, but, if it were, the principle established by Brown-Séquard, that decided reflex results on deep-seated parts is obtained through peripheral irritation or sedation, justifies the use of this agent aside from the absolute proof of its value resultant from clinical experience. I am satisfied, however, that strong disruptive discharges will pass directly through, for instance, the arm or thigh. In using any form of electricity, I have observed what appears to be a curious fact in individual susceptibility to resistance as concerns the skin, which is that the fairer the skin the more readily does the current penetrate it. Less resistance is interposed to galvanization in blondes than in brunettes when operating on deeply-seated points, such as the solar plexus, and as the color deepens so does the call for added power increase. Even in the same patient (a case of cervico-brachial neuralgia) the susceptibility varied according to the degree of tanning or sunburn present during the summer, whilst in a relative, also under treatment, who was defaced by lentigo but who did not tan, identical results were obtainable at any season, my explanation to her being that the current slipped in between the freckles, as water would slip through the meshes of a sieve. Negroes require stronger currents than albinoes proportionally to

depth of pigmentation, and static electricity escapes rapidly from their persons. I do not know that this matter has been referred to, or that such is the opinion of others; but my conclusions are the result of experiment in many applications to many subjects.

Static electricity will not, of course, supersede galvanism; it will, however, I believe, hold its own with faradism, and a thorough investigation of its merits under better auspices will show it deserving of its place in the consulting-room of the physician who knows the value of electricity in all its forms. So far I know of only two physicians in this city in addition to myself who possess static machines, and one of them has not yet given any attention to the subject. I hope to obtain better statistics shortly through hospital practice, if I can manage to interest the residents or to attend to suitable cases myself. I was greatly surprised not long ago to hear from an unusually intelligent gentleman of large practice that in many suitable cases he did not avail himself of his very complete and handsome apparatus from the fear of being considered *an electrician.* Now, although I did not believe him to be in earnest, the remark reminded me of credit lost by equally capable gentlemen from similar timidity (if a mild term is applicable) in patients who were cured by such treatment as they declined to adopt. Electro-therapy is the peer of any other plan of treatment; it needs no defence, but merits wider recognition; its promoters have done as much in the alleviation or cure of stubborn disease, not simply in general practice but in the so-called specialties, be they legitimate or superfluous, as have the most eminent practitioners with other means; and its abuse—for it has been shamefully misused, as has every valuable agent which we possess—has been confined to advertising quacks. It will be well if so much can truthfully be said of the increasing "ologies" that beset the struggling beginner in general practice. We are ourselves largely responsible for the maintenance of quackery, because we neglect valuable aids to success which these cormorants gladly seize. Every plan—good, bad, and indifferent—they try; they work much harder than is generally supposed, and they are respected in high quarters notwithstanding their business methods: in fact, they stand on a par with the educated physicians with many intelligent persons, so far as concerns the welfare of the family itself. When the thoroughbred horse gets sick, however, the best obtainable veterinary surgeon is had instanter.

"The shrewd adventurer, fresh from parts unknown,
Kills off the patients Science thought her own.
Towns from a nostrum-vender get their name;
Fences and walls the cure-all drug proclaim;
Plasters and pads the willing world beguile;
Fair Lydia greets us with astringent smile;
Munchausen's fellow-countryman unlocks
His new Pandora's globule-holding box;
And as King George inquired, with puzzled grin,
"How—how the devil got the apple in?"
So we ask how—with wonder-opening eyes—
Such pygmy pills can hold such giant lies!"*

Of course charlatans do much moral and physical injury to their patrons, but they also cure numbers who fail to get relief from legitimate medicine. The remedy for this state of affairs is to avail ourselves of every aid systematically; and in advocating the claim of static electricity to notice I embrace this opportunity to decry the popular opinion that electricity in any of its forms is an absolute panacea. It will in appropriate cases cure the patient unassisted by drugs, in others it requires the aid of medication according to indications, and again at times it plays a minor part in treatment. It is directly contra-indicated in the early stage of some diseases where later it is invaluable, and in many cases it is useless throughout. To justly serve his patient, let the practitioner arm himself with the most approved instruments of every nature, and, keeping up with the times through his books, his journals, and his medical society, give battle to humbug of all kind and degree, with the certainty of vanquishing it through superior ability as a physician, ethical standing as a gentleman, and the respect uniformly held by the people—rich or poor—for known skill in the noble profession of saving the perishable body, second only to that which aims to save the immortal soul.

246 North Twentieth St.

A CASE OF RUPTURE OF SMALL INTESTINES.

Reported by Alex. Marcy, Jr., M.D.

THOMAS F., æt. 24, married, was admitted to the surgical ward of the Presbyterian Hospital under the care of Dr. William G. Porter, August 20, 1881, for an injury received at the Baldwin Locomotive Works.

* Dr. Oliver Wendell Holmes.

On admission, his condition was as follows: Pulse, 80 to minute, full and strong; temperature, 99° F.; perfectly conscious; surface of body warm. Said he had been struck in abdomen by a piece of "ash wood" which a man was sawing with a steam circular saw. The piece was two and a half feet in length, nine inches in width, and two and a half inches in thickness. The force with which it was projected was sufficient to knock him down, and it was with difficulty that he regained his feet, only to immediately resume the recumbent posture.

On examination, the abdominal muscles were found firmly contracted; there were spasmodic contractions of the muscles of the lower extremities. He complained of great pain, which could not be located by him. In the left inguinal region, just above and to the inner side of the iliac crest, there was an abrasion two inches in length, and one and a half inches in width, with some tenderness on pressure. There were no other evidences of injury on body.

Soon after being admitted, he complained of feeling cold: external applications of heat soon overcame this. He was seen by Dr. Hext M. Perry for Dr. Porter. Dr. Perry ordered morphia sulph., gr. ¼, by hypodermic injection; soda-water and cracked ice for the intense thirst from which he suffered. At 9 P.M. the morphia had to be repeated, and again at 12. Under its influence he rested comfortably. Sunday morning his temperature was 100° F.; pulse, 112; respiration, 20. There was great pain, with some tenderness over the seat of injury. Administered morphia sulph., gr. ¼; ordered quinia sulph., gr. iv; diet of beef-tea and milk in small quantities, frequently repeated.

Dr. Perry saw patient at ten o'clock. Ordered turpentine stupes over abdomen, and enough opium to relieve pain. ♏xxx tinct. opii deod. was given at twelve o'clock, and again at three o'clock.

About four o'clock I was called in great haste to see him. Found him collapsed. Pulse, 180, and very feeble; respiration very rapid and shallow, with some dyspnœa; cold perspiration over body. He was perfectly conscious, and complained of great pain. Gave ♏x tinct. digitalis, with gr. ¼ morphia sulph., by hypodermic injection, and ♏xxx spt. ammon. aromat., with f℥ss spt. frumenti, by stomach. External heat was applied.

In twenty minutes no pulse was perceptible at wrist; heart beat tumultuously, but the sounds were distinct. Repeated the hypodermic injection.

Dr. Perry saw patient, and advised spt. frumenti f℥j to be administered hypodermically, to be repeated in twenty minutes if necessary. No improvement occurring, it was repeated, and in addition ♏xv aq. ammon. fort.

In spite of all stimulation, no reaction could be brought about, and he died at 7 P.M., twenty-eight hours after injury. Eighteen hours after death, a post-mortem examination was made in the presence of Drs. Perry and Slocum. The abdomen and scrotum were distended with gas. Over the seat of injury there was great discoloration and evidence of commencing decomposition. The peritoneum was discolored and injected; in its cavity was a quantity of liquid of a dark grumous color, looking as if it had escaped from the intestines. The viscera were carefully examined. Liver, stomach, spleen, kidneys, bladder, and large intestines normal.

Over the small intestines were scattered flakes of lymph. Their walls were softened. At the lower part of the jejunum a rent one inch long was found in the longitudinal direction of the gut. Its edges were irregular and ragged. The rest of the gut was perfectly normal, except that it exhibited those changes incident to a commencing inflammation of its walls. The omentum was very vascular and of a dark color, with small particles of lymph matting it together.

It was very plain that the intestine had been ruptured by a blow upon the abdominal walls.

The peculiarities of the case were that the injury, though of so severe a nature, was attended with the slightest, if any, evidences of primary shock, and that the jejunum, instead of the descending colon, was injured. The reason of the latter probably was that the accident occurred at a time when the descending colon was—or, if not, should have been—empty, while the small intestine, and especially the duodenum and jejunum, were filled. For the former I offer no explanation. The cause of death was most likely shock produced by the incipient peritonitis, there being such a large amount of the serous membrane involved, not only that which was torn, but the entire cavity, from extravasated contents of the intestines. Had death been due to the shock resulting from the injury, it would most likely have manifested itself earlier, and there would not have been observed evidences of commencing inflammation, as the temperature and pulse of the next morning showed there were. Secondary or insidious shock is almost always due to the formation of heart-clots. Such was not the case here.

As to the treatment. There were no indications in this case, excepting the collapse which preceded death, which would have led me to suspect so grave an internal injury. The temperature and pulse of the next morning indicated nothing but a localized peritonitis. The pain might

have been referred to the same cause. There was nothing to do but relieve the pain and attempt to combat the possible inflammation which might follow. This was done by the administration of opium, quinia, liquid and low diet, with external applications to the abdomen.

PRESBYTERIAN HOSPITAL.

CANCER OF THE LOWER END OF THE ŒSOPHAGUS, AND OF THE MEDIASTINUM, THE LATTER INVOLVING THE HEART AND GREAT VESSELS.

Read before the Philadelphia County Medical Society, September 21, 1881,

BY J. T. ESKRIDGE, M.D.

I AM indebted to Drs. F. and O. for the history of the following case:

Mr. R., a German, æt. 48, a brewer by occupation, says that, when a lad, he had an attack of dysentery; and five years before the beginning of his present illness he suffered from pneumonia. He was married, and had a large family of healthy children. He said that, outside of moderate drinking, he had led a regular life; he had not suffered from any venereal trouble, and, so far as he knew, no disease was hereditary in his family. Eighteen months ago an oppressive feeling began in the epigastric region, followed soon after by an emesis of clotted blood, which was repeated once, after an interval of twelve hours. The next six months he was troubled with obstinate constipation, retching of wind, nausea, vomiting, and pain; the latter (usually dull, but occasionally lancinating) was limited to the cardiac end of the stomach. The gastric symptoms, particularly the pain, were aggravated soon after eating. Within a year after the first appearance of the dyspeptic symptoms emaciation was apparent. Ten months after the initiatory symptoms, he noticed a difficulty in swallowing solid morsels of food, the bolus being some time in passing into the stomach. When a severe paroxysm of pain attacked him, attended by a sense of oppression in the epigastric region, he vomited a quantity of clotted blood, which gave immediate relief.

He was under the care of various physicians for eighteen months, but no bougie had been used. At this time we were called in, and made the following notes in addition to the above history. He had lost fifty pounds in weight, was suffering with constant pain in the epigastrium, experienced great difficulty in swallowing, and was annoyed by various dyspeptic symptoms, and an occasional vomiting of blood. There was a cancerous cachexia. Cold drinks increased the gastric pain, but warm ones decreased it. The lungs and heart were apparently healthy, and only a supposed hæmic murmur was heard at the base of the latter organ. A bougie one-half inch in diameter encountered too great resistance in the œsophagus to allow it to pass into the stomach. A smaller one was tried, and met with slight resistance opposite the upper border of the sternum, but when the instrument reached the lower end of the œsophagus, considerable force was required to carry it through the cardiac orifice. A few minutes after the bougie was first passed, a small hemorrhage occurred. By gradual dilatation of the strictures, we were able to pass, occasionally, a bougie one-half inch in diameter for three months, during which time our patient gained twenty pounds in weight and improved considerably in his general appearance. On our giving an unfavorable prognosis, a consultant was summoned, who substantiated our view of the case, but raised a doubt as to the malignancy of the growths, on account of the gain in flesh and general improvement of the man's health during the dilatation of the strictures. After the half-inch bougie had been passed every third or fourth day for a few months, its introduction required considerable force, and gave too much pain to continue its use. Smaller sizes were used, until one only a quarter-inch in diameter could be passed. This size could be used to the great relief of the patient until his death. Sometimes mucus and clotted blood accumulated in the œsophagus, between the strictures, and gave rise to so great distress that large doses of an anodyne were required. At these times, if the small-size bougie was passed, he experienced immediate relief without the use of opiates.

His cough was troublesome and laryngeal in character. His heart was repeatedly examined, but no organic trouble was detected, or even suspected. A short time before his death he spat up considerable matter resembling the nummular sputa of phthisis.

He died of inanition, in April, 1881, nearly two years after first complaining of gastric distress.

The autopsy was made about twenty-four hours after death, by Dr. Ott and myself. The body was greatly emaciated, only a thin layer of fat being found in the abdominal walls. Only the organs in the thoracic and abdominal cavities were examined.

Thorax.—The lungs were slightly œdematous, otherwise they were in a normal condition. The pleural cavities contained a few ounces of serous effusion, but the pleuræ were healthy, except at their upper anterior and inner borders, where they were adherent to a large growth. A large tumor surrounding the trachea, bronchial tubes, œsophagus, and large vessels near the heart was situated in the mediastinum. It was four inches in its long and three and a half inches in its short diameter, and extended in its long axis from a point opposite the upper border of the sternum downward. The pericardium, normal be-

low, was thickened in different places above, and contained one to two ounces of serous fluid. It was not adherent to the heart or pleuræ, except at its upper portion, just before it is lost in the coats of the great vessels, where general and firm adhesions were found between the tumor, heart, and blood-vessels.

Heart.—Right auricle healthy; right ventricle thickened at its upper portion by yellow-looking tissue; left auricle normal in its lower two-thirds, but adherent to and thickened by the tumor above; left ventricle apparently concentrically hypertrophied, and its upper portion thickened by a suspicious-looking mass; valves healthy.

The aortic arch throughout its entire extent lies partly embedded in the morbid growth, with its coats, to the extent of an inch, greatly thickened, being three-eighths of an inch thick at the junction of the vessel with the heart. The calibre of the aorta is lessened as far as the thickening of its walls extends, but becomes normal, or is enlarged, beyond.

The walls of the pulmonary artery are thickened in length about two and a half inches, beginning at the heart, the vessel itself being tightly adherent to the adjacent growth. The pulmonary veins are entirely surrounded by the tumor, and their walls seem to have undergone considerable change, but their calibres remain nearly normal.

The œsophagus, at its upper portion, is also surrounded by the growth which encloses the neighboring structures, four inches of its length being embedded in its substance from a point opposite the upper border of the sternum downward. The calibre of the tube at the upper portion of the tumor is almost entirely obliterated by pressure of the growth from without, and by an extension of the morbid process from the inner wall of the gullet. A growth three-quarters of an inch thick, at the cardiac orifice of the œsophagus, is found in its walls on one side, which produces a distinct curve in this portion of the alimentary tract, and greatly lessens the calibre of the tube, thus accounting for the extreme difficulty experienced in passing the bougie. The wall opposite the growth is only slightly thickened. The œsophagus is considerably dilated between the two strictures, and its walls are thinned. Two or three inches of the lower portion of the trachea, and the beginning of the bronchial tubes, are embedded in the growth. The mucous surfaces of these tubes, as well as that of the œsophagus, are considerably disorganized, evidently having been the seat of hemorrhage: especially is this true of the œsophagus. The pneumogastric and phrenic nerves escaped injury.

Abdomen.—Stomach normal, liver anæmic; pancreas contained a suspicious growth; kidneys, bladder, and bowels in a good condition.

Remarks.—In such cases as the one before us, where the œsophagus is narrowed and its cavity tortuous, a flexible bougie like those made of late for the urethra would be much more easily and painlessly passed than one after the pattern in ordinary use.

The murmur referred to in the clinical history of this case as being hæmic had its origin undoubtedly in the anæmic state of the blood and the changed condition of the great vessels that come from the heart; although, had the blood been in a normal state, the lesions in the aorta and pulmonary artery are sufficient to have given rise to a systolic organic murmur of considerable intensity at the base of the heart.

It may be asked, why was not the cardiac complication diagnosed during life? Cancer of the heart limited to this organ, unless it becomes large enough to give rise to considerable dulness or pressure-phenomena upon nerves, bronchial tubes, or œsophagus, is rarely detected *ante mortem*. This specimen shows the tumor to be large enough to have given rise to decided increase in the cardiac dulness; but we must remember that the stricture of the œsophagus was an early and distressing feature of the case, absorbing all of the attending physicians' attention, and that the heart complication probably did not take place until a short time before death, when there was too much exhaustion present to allow of a thorough physical exploration of the chest, seeing that no good to the patient could come out of it. Further, when a growth begins around the œsophagus, and gradually extends towards the surface of the chest, giving rise to dulness and pressure-phenomena, as manifested by pain, bronchial irritation and obstruction, and murmurs in the great vessels, it is very difficult—nay, almost impossible—to diagnose cancer or other involvement of the heart muscle, if the valves of the cardiac orifices have escaped unscathed.

Mediastinal tumors are usually of the nature of carcinoma, sarcoma, or lympho-sarcoma; the last variety is generally primary, the first two appearing more commonly as secondary growths. From the appearance of the tumor before us, although a microscopical examination has not yet been made, I think it belongs to the second variety, or sarcoma. The mediastinal tumor in this case is evidently secondary, for symptoms at the cardiac orifice of the œsophagus antedated by several months those developed higher up in the same organ.

There is one interesting feature in the clinical history of this case. The consultant, who saw the patient only once, questioned the malignancy of the œsophageal strictures, because the man had gained twenty pounds in weight in six weeks, dating from the time that the bougie was first passed. It is but just to state that the attending physicians held firmly to the view that the obstructions were of a malignant character, basing their opinion on the presence of the cancerous cachexia; on the constant gnawing (sometimes lancinating) pain over the seat of the strictures, although they were sufficiently dilated to allow the ingestion of solid food; on the absence of the history of injury to the œsophagus, either from blows over the sternum, or from swallowing caustic or other irritating liquids; and on the improbability of the growths being of a syphilitic nature and improving without specific treatment. After an individual has been suffering from a malignant growth until great emaciation is present and the patient is apparently almost ready to succumb to the ravages of the disease, it is such an unlooked-for thing for him to gain twenty pounds in flesh and improve in his general health that we are inclined to doubt our diagnosis when such a change occurs. It is impossible to effect so great improvement when the emaciation is due to the depressing influence of cancer *per se* upon the system. When, however, a stricture, benign or malignant, occludes the passage-way to the stomach, emaciation results largely from mechanical obstruction, which removed, the unfortunate sufferer is able to take sufficient food to cause temporary and marked improvement.

To the judicious and persistent use of the bougies by the attending physicians we must attribute the gain in flesh and the improvement in the general appearance of the man whose œsophagus with its strictures I now present to the Society.

ANTISEPTIC SOAP.—Dr. Reed (*Glasgow Medical Journal*) says that no physician should examine a woman without bathing his hands in 1–20 carbolized water and lubricating them with Atthill's soap, which consists of pure soft soap, 3 parts, glycerin, 1 part, and carbolic acid, 5 grains to the ounce. That used by Dr. Reed has 10 grains to the ounce, and is made more agreeable by the addition of a little bergamot.

NOTES OF HOSPITAL PRACTICE.

UNIVERSITY HOSPITAL.

CLINIC OF JOHN ASHHURST, JR., M.D., PROFESSOR OF CLINICAL SURGERY.

Reported by CHARLES S. DOLLEY.

COMPOUND FRACTURE OF TIBIA AND FIBULA.

THE first case I present to you to-day, gentlemen, is a rather serious one,—a compound fracture of the leg. It will give you an opportunity of seeing the manner in which these injuries are dressed in our hospital, as well as an idea of the appearances of a bad compound fracture.

By the term compound fracture we mean one in which an external wound communicates with the seat of fracture. We may have simultaneously a fracture and an external wound; but unless there be a direct or indirect communication between the two, it is not a compound fracture. Again, we speak of complicated fractures. Thus, a fracture accompanied by a dislocation of the same limb would be a complicated fracture. On the other hand, a comminuted fracture implies that there shall be at least three fragments. We may, however, have two distinct fractures; but if the lines of fracture do not communicate, we will have a multiple, and not a comminuted, fracture. The lines of fracture must communicate to produce the latter. The first question that arises in a case of compound fracture is whether the limb can be saved. Now, if the leg has been run over by railway-cars or a heavy vehicle, we usually find great contusion and laceration in addition to the fracture, and amputation is commonly required; while if we decide to try and save the limb we must expect suppuration, sloughing, gangrene, and perhaps necrosis, sometimes compelling us to resort to secondary amputation at last. Primary or immediate amputation is also called for when the great vessels and nerves of the limb are wounded. Fortunately, in the case before us, the great vessels are free from injury. There has been no arterial hemorrhage, but simply an oozing of dark venous blood. The great mobility of the limb indicates that both tibia and fibula are broken, for, when only one bone is broken, the other acts as a sort of splint and prevents great mobility.

The tibia seems to be broken almost transversely in its upper third, but we cannot distinctly locate the fracture of the

fibula. Now, what shall we do to save this limb? If the wound were a very small one, the first thing to be done would be to seal it up in some way, and thus try to convert the case into one of simple fracture. For this purpose collodion, compound tincture of benzoin, white of egg, or stitches may be employed. In this case the wound is of such a character that it is not possible to effect primary union; and should we introduce stitches, they would probably cut out, and might cause sloughing by producing increased tension.

We will therefore bring the wound together as well as possible by means of a few adhesive strips placed spirally, so as to cause no circular compression, and not entirely surrounding the limb, in order that they may yield a little, and by avoiding constriction prevent danger from gangrene.

We will next apply Dr. J. Rhea Barton's bran dressing. After placing the limb in a fracture-box, we put some oakum under the tendo Achillis, *not* under the heel; for, the os calcis being so near the surface, any pressure on it is liable to cause suffering to the patient. Another pad of oakum is placed under and around the knee-joint, and then clean bran is packed about the limb. The bran has a good effect; it is absorbent, soothing, and cooling, and in case of oozing it creates, by swelling, just enough pressure to prevent hemorrhage of any extent. It is a simple and desirable dressing,—in fact, the most desirable for compound fractures of the leg, but not so easily applied elsewhere.

TRAUMATIC BURSITIS.

In this case the large synovial bursa just above the patella is involved. The patient, about a fortnight since, received a lacerated wound over the knee, and within a few days suppuration in the bursa has taken place, and we find an opening on the outer side through which flows a thin sero-purulent fluid. We find that handling the knee-joint gives no pain, while if the joint were involved and we had before us a case of suppurative arthritis, we would find that handling gave great pain. The great risk, however, is that the joint may become involved; and it is this we must endeavor to prevent. We have been keeping the limb in a long fracture-box and applying poultices of flaxseed meal, but find that the fluid accumulates in the bursa between the times of dressing, because of imperfect drainage. I will therefore make a counter-opening on the inner side. It is a rule that abscesses near joints should be opened as early as possible, so that the articulations themselves may not become involved. On passing the probe into the bursa I can detect the point through the opposite wall; here I will make the incision. Now you may see pus escaping from both sides of the bursa. This gives the patient a much better chance. I will pass this drainage-tube through, and tie the ends together in order to prevent its escape. You will notice that I have, by the aid of my finger, made a somewhat lacerated wound, which will on this account be less liable to heal prematurely than if it were a simple cut. Upon examination I find indications of an abscess running up the under part of the thigh. I find that this region is tender and that on pressure there is an increase in the flow of pus from the wound; but the indications of pointing are scarcely distinct enough to warrant an incision. In cases of this kind, however, you cannot be too careful about making daily examinations and an early opening of the abscess. Besides the local dressing, I have employed in this case, as constitutional treatment, 2 grains sulphate cinchona and ¼ grain blue pill, given three times a day.

WHITE SWELLING.

Our next case is also one involving the knee,—a synovial disease of the knee-joint. It is not much advanced, but will afford you an opportunity of recognizing some of the characteristics of joint-disease. We notice only slight swelling of the knee, and if you could feel it you would say there was fluid present; but by tapping upon the patella we see this is not the case. In this form of disease (gelatinous arthritis or strumous synovitis) a peculiar point to be noticed is that one portion of the synovial membrane may become involved, while the other parts remain entirely healthy; but if the disease goes on, the whole joint becomes involved, and you may have suppuration and caries, and amputation of the leg or excision of the knee may be necessary. This case, however, which is really the beginning of a white swelling, has not reached such an advanced stage. There is here no pain nor heat, no redness, and but little swelling. If you should have a case of this kind in which there was pain, I

would advise counter-irritation with iodine, and the use of a poultice or the application of

Ung. belladonnæ,
Ung. hydrargyri, āā an equal part.

All that seems necessary now is to place the joint in a position of complete rest, to accomplish which I will apply a plaster-of-Paris bandage. In the application of this form of dressing, first bandage the limb smoothly to about the middle of the thigh and half-way to the ankle, then wrap the knee well in cotton to prevent excoriation and pain, and above this place the plaster-of-Paris bandage, allowing the first bandage to extend out for some distance beyond it, and apply it as far as possible without reverses by making long figure-of-8 turns.

TUMOR OF FINGER.

Our last case is to be the removal of a small growth from over the second phalanx of the ring finger. When the finger is flexed it does not move with the tendon. It may be a little fibrous growth, or a cyst which has become converted into a solid tumor. You see, on its removal, that it contains no fluid, but is a little tumor with a distinct investing capsule. Now, on cutting it open, you will notice that the cut surfaces bulge out, or become convex. This is a valuable sign in mammary tumors, being a pretty sure indication that any growth in which it is observed is of a non-malignant character: the cut surfaces of a scirrhus become concave. After dressing the wound with laudanum, I will place the hand upon a splint. Any operation in which the sheath of a tendon may have been opened may be followed by suppuration extending up and down: hence it is a safe precaution in such cases to put the whole hand at rest.

TRANSLATIONS.

PHLEGMASIA ALBA DOLENS OCCURRING IN A HEMIPLEGIC AND TERMINATING IN GANGRENE.—Dr. De Brun reports (*La France Médicale*, vol. ii., 1881, p. 27) the case of a man of 61 suffering with right hemiplegia and aphasia, following softening of the brain, in whom one day œdema of the right leg was discovered. The left leg also was slightly œdematous. There was no pain on pressure, either on the muscles or along the course of the veins, and no abnormal appearance of the superficial veins could be discovered. Six weeks later two or three violet-colored patches were discovered on the dorsum of the right foot; the leg was cold and insensible in its entire length. The next day the whole limb was mottled in purplish patches.

The patient died a week later, and at the autopsy the foot and lower part of the leg were found sphacelated. The femoral vein showed a clot along its entire course adherent to one side and leaving sufficient space along the other to permit a considerable amount of circulation. The deep femoral vein and the internal saphenous were filled with a slightly-adherent black clot, as also were the tibio-peroneal and posterior tibial veins. The femoral artery was also filled with a clot, fibrinous and adherent in some places, soft and red in others.

The arterial system generally was extremely atheromatous, especially in the smaller arteries. A curious fact noted was that in the two points where the femoral artery was closed by fibrinous clots the artery was closely adherent to the vein, so that it was almost impossible to separate them. Elsewhere, though united, the vein and artery could be separated without great difficulty. The deep femoral artery showed a soft clot implanted on the fibrous clot of the femoral at the origin of the latter. Heart fatty; no valvular lesions; hypertrophy of the left ventricle. Brain softened in places; atheroma of the cerebral arteries.

Dr. Brun, commenting upon his case, says that, independently of the occurrence of phlegmasia alba dolens in a hemiplegic which has never been noted before, the termination of this condition in gangrene is a rarity. Troisier in his thesis has cited only three cases, and has offered no explanation of their causation. In Dr. Brun's opinion the sphacelus in the case noted resulted from obliteration of the femoral artery. Further, we see here a connection between the venous thrombosis and arterial coagulation so evident that it may be asserted that the former was the cause of the latter. The two points where old fibrinous arterial clots were found were exactly those where the artery adhered intimately to the vein, and where the two vessels were adherent by an indurated interstitial tissue. It was through the influ-

ence of this transmitted inflammation that the arterial coagulation began which resulted in obliteration of the artery and arrest of the circulation. The atheroma did not seem to exercise any influence on the occurrence of the clots, since these occurred at points which were not atheromatous and were absent at atheromatous points.

TRANSPLANTATION OF BONE.—At a recent meeting of the Académie des Sciences (*Bull. Gén. de Thérap.*, vol. ii., 1881, p. 31) Dr. Ollier, of Lyons, presented a communication on behalf of Dr. MacEwen, relative to a case of transplantation of bone successfully performed. A bony deficiency of four and a half inches left in the continuity of the humerus as the result of necrosis arising from suppurative periostitis of the diaphysis had to be made good. The operation was surrounded by several difficulties, due to the fact that all trace of periosteum had been destroyed, and there was no guide as to the line in which the transplanted bone should be placed. Portions of bone were transplanted on three several occasions, the bone being taken from human subjects operated upon by excision of wedge-shaped fragments of the tibia extracted to redress anterior curvature of this bone. These bony wedges were immediately transplanted, with their periosteum attached, into the place prepared for them in the arm of the subject. These small portions of bone adhered to each other, and to the original remnants of the humerus above and below, forming finally a solid limb half an inch shorter than the humerus of the opposite side. Thus by transplantation of bone a useless arm was rendered perfectly useful.

The conclusions to be deduced from this experiment are as follows:

When six cuneiform portions of bone are taken from six different human lower limbs, removed with their periosteum and medulla, divided into small fragments, placed in the arm of a young man, in an intermuscular space, freshly opened by the scalpel to receive them, and when the grafted portions are seen not merely remaining intact in the tissues, but even uniting with one another, making in all four and a half inches of transplanted bone from which a new humerus is formed in all respects like that of the other arm, it may safely be concluded that the transplanted bones have lived and grown.

It should not be forgotten that it is a year and seven months since the first graft was made, and that the bone formed since the cicatrization of the wound made for the reception of the graft has not only preserved its original dimensions but has even grown. This sufficiently refutes the supposition of the absorption of bone after transplantation.

The appearance of the transplanted bone when the edges were refreshed was that of living osseous tissue.

The success which has crowned this operation has proved that the division of the graft into small fragments, and the *a priori* reasons for this procedure, were perfectly correct.

These considerations lead to the following conclusions: 1. Transplanted bone is capable of living and growing. 2. Inter-human transplantations of bone live and grow. 3. Inter-human transplantation of bone may give rise to practical results which shall be of benefit to humanity. 4. The totality of the osseous elements should be comprised in the transplantation. 5. The method of transplantation which offers the most chances of success is to divide the bone into small fragments. 6. To insure the success of the operation, it should be practised with antiseptic precautions.

A PECULIAR FORM OF BLENNORRHAGIC ARTHRITIS.—Duplay and Brun (*Cbl. f. Chir.*, 1881, No. 29; from *Arch. Gén. de Méd.*) say that two different kinds of inflammation of the joints are described as resulting from blennorrhagia,—one, the hydroptic, usually confined to the knee-joint, which is never accompanied by swelling of the surrounding tissues; the other, a severer form, accompanied by more pain, with swelling and redness of the joint and surrounding parts. The latter form is not always regarded as blennorrhagic by authors, and is considered very rare. Duplay and Brun, however, do not agree with this view. They have themselves met with no fewer than twenty-four cases of the severer form. Thinking that the affection is often attributed to a wrong cause, they give a more exact description of it.

The affection occurs with equal frequency in men and in women, though its cause is not so often detected in the latter. There is no relation between the severity of the arthritis and that of the preceding

urethritis. The wrist- and elbow-joints are those most usually affected, while the knee, which so frequently suffers from hydrops, is rarely the seat of the severer form of arthritis. No joint, however, enjoys immunity. The affection may develop suddenly while the patient is apparently enjoying very good health, though this is exceptional, as is also its occurrence as a result of trauma. Commonly there is a stage of incubation, with general malaise and darting pains in the externally unaltered muscles and joints,—a pain which disappears again after some days, following which the joint becomes very painful and swells.

Pain is the first symptom: it is particularly severe at night, and is increased to an unendurable degree by pressure on the line of the joint, where also the swelling first shows itself. There is no effusion, as a general thing, but the peri-articular tissue is markedly infiltrated with firm œdema of the skin, which may extend beyond the region of the joint. Pressure outside of the immediate neighborhood of the articulation is not painful, but the swelling resembles phlegmon; and incisions have been made in these cases to evacuate pus, naturally without result. The pain in the line of the joint, and, later, crepitation of the articular surfaces, serves to distinguish the affection under consideration from phlegmon. The authors have never seen abscess of the joint in blennorrhagic arthritis; other writers, however, describe this complication. There is often decided alteration of the articular ligaments, giving rise to abnormal motility of the joint.

The treatment of blennorrhagic arthritis is by immobilization of the joint. After the application of a plaster bandage, the pain ceases and the swelling goes down. The bandage may be removed at the end of four to six weeks, and gentle efforts at movement made, which can usually be done without difficulty. If the immobilizing bandage is not put on at an early date, the joint is stiffer; if not put on at all, permanent anchylosis is apt to result. However, this will occur in spite of everything in a certain number of cases.

Riedel, of Göttingen, who abstracts the original article of Duplay and Brun in the *Centralblatt*, gives two interesting cases coming under his personal observation. In one of these, salicylic acid was used quite in vain.

Case of Torticollis cured by Galvanization.—Dr. De Giovanni, says the *Deutsche Medicinische Wochenschrift* (July 2, 1881), reports the case of an unmarried woman of 27, without neuropathic antecedents, who, in 1878, following the death of her mother, fell into a condition of unconsciousness lasting for nine days, and accompanied by tremulous tonic spasm of the head and upper extremities. From that time she became more and more of an invalid, suffered with facial neuralgia, cardiopalmus, and also with a recurrence of the tremor of the head and arm by night. On the 14th of April, 1880, after unusual effort, the tremor suddenly came on with renewed severity, accompanied by a feeling of constriction in the throat, and followed by coma lasting eighteen hours; subsequently clonic convulsions and renewed coma lasting four days. On awakening after this last attack the head was found to be bent to the left and forward, restoration to its original position nearly or quite impossible. All the ordinary means of medication, both internal and external, failed. Examination made on the 16th of June, 1880, showed contraction of the left sterno-cleido-mastoid and trapezius, while the homogeneous muscles of the opposite side felt smooth and soft. The employment of an extremely weak, scarcely perceptible induction current on the left side of the neck and the edge of the trapezius gave rise at once to clonic forward movements of the head, which gradually removed the latter from its abnormal position. After the cessation of the induction current, the deformity, by this time about half remedied, showed no inclination to return. A similar current was now applied to the left sterno-cleido-mastoid, which produced like impulsive movements, gradually restoring the head to its normal condition. The sitting lasted only two minutes.

Giovanni sees in the result of this therapeutic procedure a striking confirmation of the transportation of motor energy from one side, where it was present in excess, to the opposite side, where a defect not only of motility but also of muscular tonus existed. The behavior of the contracted muscles, which lost their almost board-like hardness during faradization, while the muscles of the right side of the neck, seized with rapid clonic movements, gained volume and consistence to a de-

cided degree, is also worthy of note. The recovery of normal condition as the result of treatment was very striking and complete; the left sterno-cleido-mastoid, however, seemed slightly more contracted than the right. The application of metals was employed to complete the cure. The patient left the clinic entirely cured of the torticollis at the end of eight days.

MUCOUS CATARRHAL ANGINA TERMINATING IN SPHACELUS.—Dr. Greslon (*La France Médicale*, vol. ii., 1881, p. 29) was called to see a man 27 years of age who had been suddenly attacked with sore throat and pain in the right tonsil. Examination showed the tonsil markedly swollen, bright red in color, and showing blackish-yellow pultaceous concretions on its internal face. A gargle of borax was ordered. The next day the inflammation had extended farther, the uvula was swollen and œdematous, and the left tonsil was also involved. There was very little fever, and little difficulty in swallowing. During the following days, however, the inflammation gradually subsided under the use of gargles of honey of roses and hydrochloric acid. At the end of a week the inflammation had almost entirely subsided, but the affected parts were the seat of several eschars of a dirty-white color, surrounded by a line of demarcation and inflamed mucous membrane. The breath was offensive, and the patient rejected a tough, viscid mucus. Recovery took place without accident. This curious complication of simple angina occurring in a healthy subject is so rare as to be worthy of note.

VACCINATION PREVENTIVE OF MALIGNANT PUSTULE.—At a recent meeting of the Académie de Médecine (*La France Médicale*, vol. ii., 1881, p. 138), M. Boutet, of Chartres, gave the experiments of a committee to examine into the preventive vaccination against charbon as practised in the ovine species. A number of sheep from two farms—some vaccinated, others not—were inoculated with a few drops of blood from a "charbon" patient. The first lot of nineteen sheep, taken from the stables of Alfort, which had been vaccinated by Pasteur, survived the inoculation. Of sixteen sheep from elsewhere, all but one succumbed, presenting the lesions of malignant pustule. The blood inoculated was taken from a sheep dead of malignant pustule some four hours previous to the experiment.

VACCINAL SYPHILIS.—A letter to *La France Médicale* (July 30, 1881) says that the Algerian journals are full of the most lamentable details regarding the numerous cases of syphilis which have appeared in the garrison of Algiers, following a public vaccination made on certain Algerian soldiers. It is said that fifty-eight young men have contracted syphilis by being vaccinated with lymph given by a syphilitic infant. The medical journals are as yet silent on the subject.

A PATHOGNOMONIC SIGN OF EXOPHTHALMIC GOITRE.—Dr. Ch. Abadie, in a communication to the Société de Médecine de Paris (*La France Médicale*, vol. ii., 1881, p. 137) on a case of exophthalmic goitre, gives some very interesting points in the pathology of this affection. A pathognomonic sign, according to Dr. Abadie, is spasm of the elevator of the upper eyebrow. When the patient looks downward, the levator palpebrarum remains immovable, and the superior portion of the sclerotic is exposed. M. Abadie believes the disease to spring originally from disease of the sympathetic nerve.

REMOVAL OF FRECKLES.—

℞ Hyd. bichlor., gr. vj;
Acid. muriat. dil., f℥j;
Aquæ, f℥iv;
Alcoholis,
Aquæ rosæ, āā f℥ij;
Glycerinæ, f℥j. M.

Apply at night, and wash off with soap in the morning.

APPLICATION IN GRANULAR PHARYNGITIS.—

℞ Iodini,
Acid. carbolic., āā gr. xv;
Potassii iodid., ℥j;
Glycerinæ, f℥iij. M.

MANOL.

SYCOSIS.—

℞ Creasoti, ♏xx ad xxx;
Zinci oxidi, ℥jss;
Adipis benzoati, ℥j. M.

BOUCHUT.

NUX VOMICA AND CHARCOAL IN THE TREATMENT OF THE TYMPANITES OF TYPHOID FEVER AND ENTERITIS.—Dr. Maurice Raynaud recommends the following:

(1) ℞ Pulv. nucis vomicæ, gr. ivss;
Pulv. anisi, gr. ijss. M.

Divide in two powders, one to be taken morning and evening.

(2) ℞ Pulv. carbonis ligni, q. s.

Two tablespoonfuls during the day.

PHILADELPHIA
MEDICAL TIMES.

PHILADELPHIA, OCTOBER 22, 1881.

EDITORIAL.

THE MEDICAL SERVICES AND THE PROFESSION.

THERE is perhaps no professional custom more proper and commendable than that which puts the services of a physician at the command of his fellows when they or their families are sick. It is right,—because, sooner or later, a *quid pro quo* is given and received; for we all are mortal, and to each comes, sooner or later, suffering and the need of relief: it is most praiseworthy,—for it, above all other customs, draws the members of the profession into a common bond of brotherhood, tending always to mutual trust and affection. But even a custom so proper as this may be subject to abuse, and, in fact, it is abused. When a physician lives at a distance, and requires for his family the opinion of an eminent specialist, it may be a question whether he has a right to the opinion and services of such specialist for nothing. We ourselves incline to the belief that such services should be given without compensation, provided the physician who receives them comes to the specialist and saves his time as much as possible. If a physician be a man of independent wealth, even if he be a practitioner, we think he should always offer compensation, and, under some circumstances, might well insist upon its being accepted.

There is a class of doctors who often expect, but who have no proper claim to receive,—at least to our thinking,—gratuitous medical advice. A man inherits or marries a fortune and lives at his ease. What right has he to the time and talent of his poor toiling brother, simply because he himself some years before paid a small fee to some professors and passed the necessary examination? Or, again, leaving his profession, the quondam medical man engages in business, and ceases to be an active physician. We insist that his claims also are forfeited. In either case how shall the *quid pro quo* be given? Is the rich man to furbish up the old out-rusted weapons of his warfare and to fight the battle of disease anew? or is the man of business to take upon himself duties to which he has long been unaccustomed? It is preposterous: the *quid pro quo* cannot be given, and when no return is possible the demand for free services is an imposition which no right-thinking man can make upon another, and which we think no man in active practice should submit to.

LEADING ARTICLES.

VACCINATION.

THERE is an ignoble as well as a noble disregard of our own danger. There is a disregard of danger for others which is criminal. This is only too well exhibited by the indifference of our municipal rulers to the daily increase of variola, and their unwillingness from a false economy to provide the means for thorough vaccination.

Whatever difference of opinion there may be as to the real protective power of vaccination, it is still our only safety, and the only practical means known of suppressing an epidemic. To be a perfect success it must be universal; but in lesser degree every additional vaccination in a community increases by that much its safety. To assist its operation there are two other procedures,—isolation and disinfection. Were any one of these three completely carried out, smallpox would cease. In the certainty that such completeness cannot be attained, the imperfect performance of all three forms our best protection.

Vaccination, if municipal economy forbids its extensive performance, can be used to best advantage in limited areas to render safe all who have been immediately exposed,—viz., all of the inmates of a house in which a case occurs, with the adjoining houses. Then isolation comes in, and should forbid not only the attendance of the children at school but of the older

members at their daily employment in stores, factories, and workshops. And, for the reason that people must live, and the prohibition of work would lead to concealment, provision for the food and fuel, etc., of the inmates of infected houses would be true economy. For the great waste is in epidemics; the great saving, in their prevention. Then at last, lest infected clothing and bedding should prove dangerous, authority should superintend disinfection, and, if needed, the destruction of such articles as are contaminated, and among the poorer classes compensation should be made for the articles destroyed. Now, at the very commencement of the work the difficulty of providing funds for vaccination meets us. Municipal economy is such a rare virtue that it should be treated with the most tender consideration and respect. But when we find a body of men like the Councils of our city almost unanimously opposed to the granting money for this purpose, are we to immediately consider them as in league with destruction and pestilence and steeled against the fear of personal risk, or must we look further and see in their hesitation and opposition a distrust, not of the value of vaccination, but rather of the way in which the money will be used? This part of the matter should be clear as noonday. Every cent intrusted to the Board of Health for this purpose should be rigidly accounted for. Let no man be able to say that the work has not been done. Let there be no talk of false lists of names without the evidence to refute it. And let vaccination, if it cannot be universal, be so done as to be most useful,—viz., where it is most needed.

There are several elements going to cause our present unprotected condition. The time-honored custom on the part of the family physician of vaccinating without additional charge the infants over whose births he has presided has really tended to lower its value in popular estimation. The outcry of the anti-vaccinationists of Europe has reached our shores; and, while formerly in this country the human crust was almost exclusively used, now the poorest and most ignorant vie with the more intelligent and cultivated in the demand to be "done with cow-pox;" so that a change has taken place, which was hailed by the profession with joy when they remembered the charges of impure virus and bad vaccination so often brought against them whenever anything went wrong at the time or any eruption occurred in subsequent years. Certainly with bovine virus no such charges could be brought. But are we sure that it is all gain? In the matter of public vaccination this change has been disastrous. The poorly-paid vaccinator finds his little remuneration melting away in the cost of virus. Not only does he get less, but the extreme uncertainty of cow-pox doubles his work for each successful case, on which alone his pay is based: so that on the fairest calculation he receives for his work done and visits made not more than one-fourth what he formerly did, the cost of virus being deducted,—*i.e.*, two insertions for each success, and the work doubled. Thus, when the funds are not forthcoming, while formerly with the use of the human crust the vaccinators would still go on, giving time and labor to the work, to do the same now entails double labor and the actual outlay of money in considerable amount, the return of which is uncertain. This of course strangles off the work.

As to the actual advantages of bovine virus, a word might be said here. To the writer it is by no means certain that we have not taken, in this matter, that easy transit from the frying-pan to the fire. Certainly, after a very considerable experience as a vaccinator for sixteen years, he can say that in the last two years he has had more trouble from bad arms, seen more children endangered, had more failures in primary vaccinations than he had in the many years previous, when he was using not bovine but humanized virus, and that there is a grave suspicion in his mind that a number of children have been far more seriously and permanently affected by the bovine virus than is at all desirable.

The outbreaks of syphilitic vaccination on record have occurred, for the most part, in Europe, and have been generally attributed to arm-vaccination, during which blood is liable to mingle with the lymph, a thing much more rare with us in the days when the human crust was employed; but the writer, in examining many points taken at random from any and all the sources that supply us, finds traces of blood, as is very natural, upon a large proportion. Now, are we so very sure that there are no bovine diseases capable of inoculation besides the cow-pox? No anthrax, no tubercle, no pleuro-pneumonia or

other deadly disorders? And then the uncertainty must be considered, making extra labor to the vaccinator, delaying protection when instantly needed in the presence of the disease, and in the revaccinated leading to a false security, the failure being attributed to insusceptibility from the previous vaccination still holding good.

The public are by no means unwilling to learn. Always interested in medical matters, what they want is some statement, from recognized authority, in the elementary facts about vaccination. They should be brought to know the value of vaccinations from virus once removed from the bovine, its reliability, longer retention of power, freedom from the risks, whatever they be, of humanized virus of long descent on the one hand, and of bovine virus on the other. With this, too, should go the statement that vaccination, while one of the lightest of diseases, has its own risks and its own small percentage of mortality,—it may be one in ten thousand, perhaps less; but this, contrasted with the forty to sixty per cent. of variola, is but a shadow of danger.

In the matter of the protective power of vaccination, too, something may be said. Smallpox, in the days before Jenner and before inoculation, was a scourge whose intensity can only be realized now by watching its effect upon wholly unprotected populations. It was a universal scourge: few, if any, escaped it when exposed. It swept off whole communities, as it does to-day in Indian villages, leaving a few scarred and disfigured survivors. Now, in considering the protection of vaccination we are usually called to contrast the percentage of deaths from varioloid with those from true variola,—three or four per cent. with forty to sixty per cent.; but the difference is really much greater. This contrast leaves out of sight the unnumbered thousands who are daily and hourly exposed to the dread disorder but do not take it because protected by vaccination. The mortality after vaccination, an unknown but very small percentage, plus the almost infinitesimal mortality from vaccination, form together a truly insignificant total, and no man who has been vaccinated in infancy has any right to oppose vaccination; for, in truth, it is very probable that only by the grace of vaccination does he live to oppose it. E. W. W.

PROCEEDINGS OF SOCIETIES.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

A CONVERSATIONAL meeting of the Society was held at the hall of the College of Physicians, Philadelphia, September 28, 1881, Dr. Albert H. Smith, President, in the chair. Dr. W. R. D. Blackwood read a paper on "The Application of Statical Electricity to Practical Medicine," which received the customary vote of thanks.

Dr. Charles K. Mills said that he had listened to the paper with much interest. Although his personal experience with this form of electricity had not been very extensive, his attention had been recently directed to the subject quite strongly. He had also witnessed its use in the practice of others. From his own observation he would feel inclined to say not that it was an agent "with a wide field of usefulness," but rather one whose range is limited, although of great value in its own field.

With reference to some of the terms employed, he would like to know whether or not the static electricity received and felt by the patient is not always *induced*.

While in New York, attending the last meeting of the American Neurological Association, he had heard a paper by Dr. Morton upon static electricity, and he had learned some facts in regard to its recent employment by Dr. Morton, Dr. Beard, and others, and, so far as he could observe, some really useful results had been obtained.

In listening to the lecturer's remarks this evening, he had heard several cases reported. He inquired if the relative merits of galvanism and statical electricity had been studied in these cases, so as to establish a comparison between the different forms. Speaking from his own experience, he would be inclined to place galvanism in the front rank, and above all other forms of electricity, for the treatment of neuralgia. It should always be remembered that in hysteria and allied nervous disorders, and in cases of spermatorrhœa, apparent improvement may follow very different kinds of treatment; in fact, such cases do not afford very reliable therapeutic conclusions as to the benefits of any single form of treatment.

In connection with this subject of the use of statical electricity in medicine, Dr. Mills said he wished to make some remarks on *æsthesiogenic agents*. These are substances which, when applied to the surface of the body, have the power of modifying its conditions of sensibility, as they restore sensibility to anæsthetic regions, or, under certain circumstances, they may produce anæsthesia. In point of fact, they affect mobility, temperature, capillary circulation, etc., as well as sensibility, etc.; but the modifications of the

latter are the most striking, and those to which attention was first called. The phenomena of *metalloscopy* and *metallotherapy* are embraced in a discussion of æsthesiogenic agents. His attention was first directed to the subject about six years ago while reading a little book on static electricity by Arthius of Paris. Since that time Charcot and his followers have made the subject famous by experiments at La Salpêtrière.

Burq, Charcot, and others found that in cases of hysterical anæsthesia, and in other affections, patients showed a susceptibility to certain metals. When, by trial, the proper metal was found, the anæsthesia would temporarily disappear under its application. In case of hemi-anæsthesia, the disappearance of the anæsthesia on one side of the body would sometimes be followed by its appearance in a symmetrical region of the opposite side. It has even been established by Charcot that *consecutive oscillations* of sensibility may take place under metallic applications. Under the influence of a metallic application in a case of left hemi-anæsthesia, sensibility returns on the left, but the right side becomes insensible by *transfer;* in a few moments, however, anæsthesia returns to the left, allowing the right side to recover its sensibility; then the first changes take place again, and so the oscillations continue, sometimes for several hours. Vigoreux made the important discovery that the temporary return of sensibility could be rendered definitive by maintaining in contact with the skin a plate of metal which was neutral,—that is, which was incapable of producing metalloscopic phenomena. The plates were found to act on special sensibility in the same fashion as on general sensibility. Many of these facts are detailed in Richer's great work on Hystero-Epilepsy.

S nce the early observations of Burq, it has been found that plates of metal are by no means the only æsthesiogenic agents. Subcutaneous injections of metallic salts, feeble galvanic and faradic currents, bar-magnets, electro-magnets, solenoids, vibrations of sonorous bodies, ice, cold water, hot water, mustard plasters, blisters, jaborandi, graphite, calcium fluoride, etc., have all been found to be such agents.

Of all the æsthesiogenic agents which have so far been investigated, however, *static electricity*, which we are discussing this evening, is, according to Dr. Romain Vigoreux, the most powerful and the most generally applicable. In hystero-epilepsy or grave hysteria, as is well known, disturbances of sensibility are among the most prominent manifestations. Vigoreux claims to have obtained great success with static electricity in the treatment of hysteria major, its beneficial action being probably due to its great efficacy as an æsthesiogenic agent. Dr. Mills could see how it might be very useful from this stand-point. He believed, with the French writers on hysteria, that hysterical anæsthesia was probably of cerebral origin, the changes in the brain being temporary vaso-motor or molecular disturbances, and that static electricity and other æsthesiogenic agents made impressions on the surface of the body, which, being carried by sensory nerves to the nerve-centres, so modified the latter as to cause the disappearance of the hysterical phenomena.

Dr. Carl Seiler said that there were two points in the paper which might be slips of the pen, or might need correction, if he had not misunderstood the lecturer. It had been stated in the paper that the induced current is used in sending articulate speech as well as written matter, and that it was true that in the telephone, as now used in this country, the induced current was made use of in order to overcome the disturbances of other currents along the line; yet in the Morse telegraph instruments, both in the relay and sounder, the line-wire directly is used in order to develop the electro-magnetism in the soft iron cases of the helixes, by which the armature making the signs is agitated.

The lecturer had also stated that he used an electro-motor to run his electric machine, and that the battery used for running the motor could be used also for galvano-cautery purposes. This needed some explanation, inasmuch as it had been found that in order to develop the greatest amount of power in a motor the plates of the battery should be small and the number of cells connected for intensity should be large, while in a galvano-cautery battery the more surface of zinc is exposed to the action of the acid, that is, the larger the plates, the better, and that but few cells with the elements connected for quantity of current gave the most heat.

The lecturer, in closing the discussion, could not agree with Dr. Mills as to the field being a narrow one, but believed a wide sphere existed for the use of static electricity. Static discharges are of course induced, yet the induced current of Morton is a further induction, as described in the paper.

Dr. Blackwood could not admit any parallel between static electricity and metallotherapy. From his own experience and from careful observation of these experiments in the hands of others, he is thoroughly convinced that the effect produced by the application of metal plates of any kind, solenoid or magnets, is purely imaginary, the patient and the doctor in such exhibitions being equally culpable,—the one as a fool and the other as a fraud. The metallo-therapy, hypnotic, and allied phases of humbuggery were beneath the notice of reputable physicians, and it was to these and similar quack-leanings that he adverted in his paper. Statical electricity produced palpable physical effects, not controllable by the imagination of any one, and the utmost liberality

could not couple the action of any form of electricity with transparent charlatanism. He fully recognized the value of faradism, and particularly of galvanism, in daily practice, not only in neuralgia, but in many other diseases, and gave due credit to each in his paper. In two of the reported cases the failure of galvanism was noted before resorting to static electricity, and the tenor of the paper was to advocate the claim of statical effects as worthy of a place *beside* those of dynamic electricity, in the consulting-room of the physician.

The remarks made by Dr. Seiler were inaccurate. The telegraph, in all its forms of registers, relays, sounders, repeaters, simple or multiplex, is worked not by direct galvanic currents, but by electro-magnets, and the costly, cumbrous, and troublesome galvanic cells are being rapidly displaced by dynamo-electric machines for main batteries. Local batteries also act by inducing magnetism in the office instruments, and the only telegraph which ever employed the galvanic current directly to stain prepared paper was simply a curiosity, which could not and never did do actual business. Telephones also are electro-magnets of varied forms, and their operation, with that of their alarms, is through induction. The improved transmitters depend on induction-coils for their superiority, and galvano-faradic and magneto-faradic instruments, as stated in the paper, exert an enormous influence in the operation of every-day work in science, art, and the business world. It is simply a fact that the lecturer uses his motor battery for minor galvano-caustic purposes, for which its scope is ample. His battery is connected in series for intensity, and by reversion of the commutator a quantity-current is obtained. The arrangement is of his own design, but a somewhat analogous method is used in other makes. Dr. Blackwood had made no slip of the pen, as suggested, but meant precisely what he said in his essay.

He had intended demonstrating the application of statical electricity at this time, but continuous attendance for nearly three days past on a case of opium-poisoning, and consequent indisposition, was his apology for neglect to do so: at a future time he might ask the pleasure of showing this before the clinical section.

PATHOLOGICAL SOCIETY OF PHILADELPHIA.

THURSDAY EVENING, SEPTEMBER 22, 1881.

The PRESIDENT, DR. S. W. GROSS, in the chair.

DR. F. P. HENRY presented a hen in which the mesentery was the seat of a morbid growth closely resembling myxoma in its gross appearance. The history of the case was entirely *post mortem*. The morbid growth attracted attention at one of the markets, and the entire carcass of the animal, with the tumor *in situ*, was carried by a man who obtained possession of it to the Philadelphia Dispensary. One of the physicians connected with that institution referred him to Dr. Henry as one likely to be interested in the subject; and to this gentleman, whose name could not be ascertained, the Society is indirectly indebted for the opportunity of beholding what is, without doubt, an exceedingly curious and interesting specimen.

As the specimen was only obtained by Dr. Henry a few hours before its exhibition, he had no opportunity to give it a thorough microscopical examination. A partial examination, however, demonstrated that the stroma is composed of dense connective tissue, and that the fluid occupying the cellular interspaces is very poor in solid matters, a few oil-globules and blood-cells being the most conspicuous, and these probably came from the stroma.

The growth appears large enough to have produced some deformity of the animal during life; but on this point nothing could be ascertained. The liver is healthy, and the tumor is not ovarian. It corresponds precisely to the mesentery, the intestine occupying its convex borders. There is no intestinal obstruction. On first sight the appearance presented by the mass closely resembled that of an extreme emphysematous infiltration of loose connective tissue; but the sense of touch immediately corrected this idea. The growth is firm, non-crepitant, and elastic.

At Dr. Henry's request, the specimen was referred to the Committee on Morbid Growths.

Report of the Committee on Morbid Growths.—"A microscopic examination of the tumor of the mesentery of a hen, presented by Dr. F. P. Henry, showed that it presented the structure characteristic of myxoma.

"October 13, 1881."

Cancer of the liver. By Dr. J. H. MUSSER.

I am indebted to Dr. McElree for the specimen I present to-night. The patient was attended by him during her life, and at the autopsy I had the opportunity of studying her.

The patient was an Irish laboring woman, 58 years of age, of good habits. She suffered during the two years previous to her death. Attacks of dyspepsia, accompanied by acidity, flatulence, and irregular bowels, with uneasy sensations in the hepatic region, annoyed her during the first year of her illness. The following year the dyspeptic symptoms continued, and pain became a prominent symptom. The pain was of a dull character, irregular, however, as to severity,—at one time in the hepatic region, again in the shoulders, or in the loins. The general health began to fail. In July, 1880, she had an attack of thermic fever. Three or four weeks after-

wards she became jaundiced. The icterus came on gradually, and was accompanied with the usual dyspeptic symptoms and constipation.

In October, 1880, Dr. McElree saw her for the first time. I learn from him that she was much emaciated, with a dry, harsh, deeply jaundiced skin, and yellow conjunctivæ and mucous membranes. Her appetite was lost; dyspepsia continued, bowels constipated, clay-colored stools. The liver was enlarged, outline not detected on palpation; pain on deep pressure in region of gall-bladder. Heart and lungs normal.

I saw her with Dr. McElree, November 28, 1880. The jaundice had improved. Other symptoms as above noted. Pain was greatest in the lower part of back. The past ten days has had ascites. Two days ago œdema of feet began. Liver-dulness commenced anteriorly at fourth interspace; in axilla at fifth rib; lower border in both regions at margin of ribs. Left lobe seemed enlarged. Nothing noted on palpation. Spleen slightly enlarged. Urine contained bile-pigment and a trace of albumen.

We learned that a sister had died of cancer. By exclusion, cancer of the liver was diagnosed. She died of exhaustion in ten days.

Autopsy, eight hours after death.—Rigor mortis well marked. Body emaciated; skin of a dark-yellow color; œdema of feet; great distention of abdomen; tissues stained by bile.

The abdominal cavity contained about four quarts of serum. The organs were in their normal relations, and all healthy save the liver. Pushed up by the fluid in the cavity, that organ occupied the position indicated by percussion during life. Viewing it *in situ*, the gall-bladder was noted to be in front of the liver, between the right and left lobes, and two inches from the lower margin. On closer examination, it was found that the left lobe was two inches wider than it generally is; that the right lobe was irregular in shape. On the upper surface, near the longitudinal fissure, was a marked prominence, section of which showed it to be caused by the growth of a large cancerous mass, nearly the size of a base-ball, in the liver-tissue, to the left of the centre of the right lobe. There were two other cancerous masses. One was in the lower part of the left lobe, near the longitudinal fissure; the other was in a corresponding position in the right lobe, just over the normal position of the gall-bladder. Both masses had the appearance and character of scirrhus, being gray, dense, fibrous-looking structures, with an umbilicated depression on the surface. On section, they creaked under the knife; the mass was white, with yellow streaks running through; the centre was soft. The mass in the right lobe was not as distinctly circumscribed as the other, but encroached upon and extended along the left edge of the right lobe. By its contraction the curious malposition of the gall-bladder was produced. It was twisted through the longitudinal fissure and thrown on the upper surface of the liver, resting partly on both lobes. The ducts were pervious to a fine probe; the bladder was partially distended with bile. The lobules were greenish-colored in the centre, surrounded by a yellowish-white ring. On microscopical examination, the masses were of the nature of scirrhus, with degeneration of the central portions. The liver was fatty.

Dr. MUSSER remarked that he thought the appearances presented by the tumor unusual, and accounted for them by its not occurring in the circumscribed but in the diffused form.

Dr. FORMAD thought that the unusual appearances might be due to the growth being primary and central, which is of rare occurrence, while if secondary, as is so common, the periphery of the organ is more apt to be attacked. By this difference of site it may be possible to distinguish *approximately* between primary and secondary carcinomata of the liver.

Dr. MUSSER differed from Dr. Formad, and pointed out that in his specimen some considerable portion of the periphery *was* involved by the morbid growth.

THURSDAY EVENING, OCTOBER 13, 1881.

Adeno-carcinoma of breast. Presented by Dr. J. M. BARTON.

Mrs. K., a pale and thin but active married lady, 40 years of age, who had never borne children, but who still menstruated quite regularly, had suffered for five months with a tumor of the right breast. It had not been preceded by any injury that she was aware of, nor was there any hereditary carcinomatous taint. The tumor was the seat of sticking pains, particularly at night, and its rate of growth had been quite regular. The opposite breast was much atrophied, and was less than one-half the size of the diseased one. The disease involved the entire gland; the skin was infiltrated and adherent, and the veins slightly enlarged. The growth was about four by five inches in its diameters and two inches in length, perfectly regular in its outlines, and moderately hard. The nipple was retracted; the mass was freely movable over the pectoral muscle, and there was no glandular involvement. On June 28 I removed the growth, together with some of the surrounding skin. The hemorrhage, though free, was much less than we would have expected from a sarcomatous growth of similar size. The large open ulcer healed rapidly without complications, and has been entirely closed for some weeks.

The microscopic section which I have here shows that the increase in size of the breast is mainly due to glandular elements. The ducts, acini, and fibrous stroma are in nearly normal proportions to each other. Many of

the ducts have an increased number of, and some are distended with, epithelial cells. Occasionally typical alveoli filled with epithelial cells are found. They are much more numerous in the skin than elsewhere, and the disease might here be regarded as fully-developed scirrhous carcinoma.

REVIEWS AND BOOK NOTICES.

A Hand-Book of Vertebrate Dissection. By Prof. H. Newell Martin, M.D., and W. A. Moale, M.D. Part I.—How to Dissect a Chelonian.

This little book of 90 pages is the first of a series which is intended to furnish aid to the teacher of biology by enabling him to put in the hands of his students practical dissecting guides intended to be used between lectures, but not to take the place of personal teaching. There is no "namby-pamby" "popular" science in the brochure: its pages are occupied with strictly technical though simply written directions; and the man who has, with the turtle on the table, worked through the manual conscientiously, must be of very feeble mental organization if he has not acquired a thorough fundamental knowledge of the anatomy of the animals of the class, and widened thereby his own general anatomical horizon. It would argue very well for the future science of the country if this hand-book and its successors should be widely used in the United States. The publication certainly is another impulse imparted by the Johns Hopkins University to the study of biological sciences in America.

Manual for the Physiological Laboratory. By Vincent Harris, M.D., and D'Arcy Power, B.A. Oxon. New York, Wm. Wood & Co., 1881 (English print). 12mo, pp. 124.

This little book is a useful aid to work in the physiological laboratory. Its main strength lies in the directions given for conducting microscopic examinations of tissues. Fifteen pages only are assigned to physiological chemistry. A promise is held out to the reader that an account of the chief physiological instruments employed in the laboratory, with the methods employed in using them, will follow the instructions given in the volume; but, until these appear, the nature of the manual is scarcely in consonance with its title. So far as they go, nothing but praise can be awarded the instructions. They appear to be the result of painstaking care and much experience. H. A.

The Wilderness Cure. By Marc Cook. New York, Wm. Wood & Co., 1881.

A very readable little book, chiefly from the pen of its author (one-third of it being from that of Prof. Loomis),—giving much information about the proper fitting-up of an invalid's camp, but scarcely a tithe of the information about the Adirondack region that is to be found in a recent leader in this paper. After much experience in almost every part of the Adirondacks, we are filled with wonderment at the figures given by Mr. Cook as to the cost. We have always found it well to make expense no object before indulging in the much-valued joy of the wilderness. To find a good Adirondack guide who will work for a dollar a day is a good fortune seldom given to ordinary mortals. We think seventy-five dollars a month, plus the expenses of getting out and in, the minimum which an invalid ought to expect to spend for a whole season; and if he is to have the luxuries spoken of in the book before us, one hundred dollars a month will be little enough.

The Applied Anatomy of the Nervous System. By Ambrose L. Ranney, M.D. New York, D. Appleton & Co., 1881.

This book differs from any one that we are acquainted with, in that under the name of applied anatomy it really offers a series of lectures upon the normal and morbid physiology of the nervous system, giving just so much of the anatomy as is required for a row of pegs upon which to hang the rest of the book. As a method of teaching medical students, perhaps the plan is a good one; but as a plan of writing for the profession, probably the method is a bad one. The difficulty is that there is not enough of anatomy for the man who wants anatomy, not enough physiology for the man whose object is physiology, and altogether too little disease-discussion for the clinician. The old proverb of falling between two stools comes into remembrance. It may be, however, that in all this we are mistaken; and we think Dr. Ranney has done his work well and given accurate information in a simple, readable style. The illustrations are both abundant and good.

Sur l'Emploi de la Méthode Galvano-Caustique dans le Nez et le Pharynx. Par Victor Lange. (On the Use of the Galvano-Caustic Method in the Nose and the Pharynx. By Victor Lange.) Copenhagen, 1881. 4to, pp. 14.

This brochure is a reprint of an article read before the Laryngological sub-section of the London International Medical Congress. It is interesting as an expression of opinion concerning the value of the galvano-cautery in the treatment of some forms of nasal and pharyngeal disease. The diseases for which, in the judgment of M. Lange, the method named is especially serviceable, are chronic tumefaction and polypoid degeneration of the nasal mucous membrane, and follicular pharyngitis associated with tumefaction. Upon these points there are probably slight differences of opinion among laryngologists. The author might have extended the list without violence to truth. H. A.

HARROGATE WATERS. Data, Chemical and Therapeutical. With Notes on the Climate of Harrogate. By GEO. OLLIVER, M.D. Lond. London, H. R. Lewis, 1881. Philadelphia, Presley Blakiston, 1012 Walnut Street.

The title of this book expresses so clearly what the scope of the work is that it is not necessary to say aught about it. The invalid desiring to visit Harrogate may find in the brochure a complete and reliable guide to the place, whilst the medical man desirous of knowing the physical and chemical character of the various waters, and their reputed effects upon disease, will find in the elaborate tables and discussions all he needs.

LANDMARKS, MEDICAL AND SURGICAL. By LUTHER HOLDEN, F.R.C.S. Assisted by JAMES SLEUTER, F.R.C.I. First American from the Third English Edition. By W. W. KEEN, M.D. Philadelphia, H. C. Lea's Son & Co.

The old editions of Mr. Holden's Landmarks were very well known and well esteemed books. This last appearance of the work is, we think, no less worthy of respect. For a book of 150 small pages it has had many godfathers, but we can say that the additions made by Dr. Keen seem to us judicious.

GLEANINGS FROM EXCHANGES.

IMPORTANCE OF THE EARLY RECOGNITION OF EPILEPSY.—In a paper on this subject (*New York Medical Record*, August 13, 1881) Dr. E. C. Seguin says, after discussing the distinction between eclampsia and epilepsy,—

We may sum up the statements of high authorities by saying that eclamptic and epileptic attacks are similar in character and practically indistinguishable.

This being admitted as being true of the *symptoms*, we yet have the two *affections*, eclampsia and epilepsy, to differentiate; and it is this differentiation or differential diagnosis which is all-important for the welfare of our patient. It is not so very serious to consider eclampsia as epilepsy for a few months; but the converse mistake—the mistake which I believe is common—is in one sense fatal to the patient. The non-recognition of epilepsy allows of recurrence of paroxysms and the establishment of the epileptic habit.

Upon what grounds can a reasonably accurate diagnosis be made? I believe this can generally be done by attention to the physiological law of convulsibility, and to the relatively small importance of local irritations, internal and external, after the third year of life, as a cause of eclampsia. A third rule which must be borne in mind is that at almost any period of life uræmia may cause eclampsia. This is more especially true of young subjects who have just passed through scarlatina with nephritis, or who have had symptoms of renal disease from any cause; and also of adults,—males between thirty-five and fifty, who are liable to contraction of the kidneys.

A fourth diagnostic rule is that, in adults particularly, syphilis may cause eclampsia (*i.e.*, acute, curable epilepsy).

Plumbism and alcoholism sometimes cause eclampsia, but probably in most cases by producing renal changes and uræmia.

To apply these principles to practice, let us suppose cases of first convulsions with loss of consciousness, occurring in subjects of various ages.

1. Convulsive attacks in young children under three years.

If we can exclude injury to the head, gross organic disease of the brain, and microcephaly from premature closure of the fontanels, the attack is probably eclamptic. This probability is increased to almost a certainty if we can accurately determine the existence of sufficient systemic or local causes for the attack.

Upon this question of sufficiency of the cause, much might be said. Often the physician is satisfied with merely determining the coincidence of a fit with a local irritation or a supposed local irritation. Soltmann is especially emphatic in his advice to judge these coexistent conditions carefully before pronouncing them to be causes and the attacks to be merely eclamptic.

The occurrence of a single fit enhances the probability of its being the first seizure of epilepsy.

The occurrence of repeated attacks in the course of an hour or two makes it probable that the convulsions are caused by fever, by gingival, gastric, or intestinal irritation, or perhaps by some peripheral cause.

2. Convulsions in young persons from three to fifteen years of age.

These are quite certainly epileptic, if we can exclude renal disease. The occurrence of attacks of an eclamptic nature (*i.e.*, ephemeral and curable) in such subjects from intestinal or gastric or sexual irritation is exceedingly rare, and the mistake—the terrible mistake—of assuming such to be the pathology of convulsions is frequently made, even by experienced physicians.

I would repeat, and the foregoing cases bear me out, that convulsions from worms, from indigestion, from lithæmia or oxaluria, in youth are exceedingly rare, and that in the treatment of such a case the patient should be given the benefit of the doubt and be put upon a rigid anti-epileptic treatment by means of bromides, while the treatment for the supposed local or diathetic cause is being carried out.

3. Convulsions in adolescents and adults. These are to be judged by the same general

rules as No. 2, with the addition that two morbid conditions should be carefully searched for, especially when the first convulsion occurs after twenty:

a. Syphilis. This may be acquired at almost any age, but especially after sixteen or eighteen years. Nothing in the social standing of the patient should deter the physician from inquiring delicately, yet deeply, into this question.

b. Chronic interstitial nephritis, more particularly in subjects of forty years and upward. The presence of a hard pulse, of over-action and hypertrophy of the heart, the passage of an excessive amount of urine of low specific gravity, sometimes containing albumen (never much), and a few hyaline or granular casts, go to justify the diagnosis of contracted kidneys, consequent chronic uræmia, and the occurrence of eclamptic attacks.

If we exclude these two pathological conditions, a convulsion in an adult, especially if a single fit, is quite certainly epileptic, and will be followed by others, after a lapse of time which may vary from a few days to more than a year. Of course the existence of a long interval of health after one epileptic attack in no wise justifies a physician in pronouncing the disease not to be epilepsy, as is shown by some of the cases I have read, and by numerous others which I might cite.

To sum up the early diagnosis of convulsions:

1. After the third year such attacks are very probably epileptic. The possibility of uræmia and of syphilis should be borne in mind, and a careful investigation be made as to their existence.

2. Under the third year the attack may be eclamptic,—probably is; but its causes should be carefully judged.

3. In many cases under three years it is well to give a moderate amount of bromide of potassium (or sodium) with regularity for several months after a convulsion,—that is to say, in such cases as do not present an evident, indisputable pathological condition sufficient to cause eclampsia.

4. In all cases above three years the bromide treatment should be at once instituted and kept up for many months.

This will not interfere with the treatment by appropriate remedies and by hygiene of gastric or intestinal indigestion of worms, of sexual irritation, of uræmia, and of syphilis.

Besides bromides, a variety of treatment is demanded by different forms of epilepsy, according to the pathological condition; but the consideration of these indications is foreign to this paper, whose main object is to encourage the prompt and proper treatment of epilepsy at the earliest possible moment, viz., in most cases after the first attack.

I am confident that, if this were done, the prognosis of convulsive epilepsy would be greatly changed for the better.

THE DIAGNOSIS OF SLIGHT EPILEPTIC SEIZURES.—Dr. E. C. Seguin (*New York Medical Record*, August 13, 1881) says, in considering the diagnosis of *petit mal*, consisting of epileptic vertigo (so called), and of imperfect or aborted spasmodic seizures,—

In this category I do not include the localized or hemiplegic epileptic spasms, which I have treated of in a former paper.

Petit mal, or epileptic vertigo, is often allowed to pass for vertigo caused by indigestion. In my experience, physicians are very loath to call these slight attacks by the terrible name of epilepsy, and so delude themselves and their patients until the recurrence of a convulsive attack settles the question.

Besides, I find that, even when the attacks are recognized as epileptic, a most unfortunate statement is made that these are slight and manageable attacks, whereas the truth is that petit mal is much more intractable than grand mal, and often leads to more evident mental deterioration.

The correct diagnosis of petit mal is feasible, provided a good description of the seizures be had.

From vertigo it is distinguished by:

1. The subjective phenomena. In vertigo there occurs a sensation as if the patient himself, or objects about him, were whirling around; in petit mal there is no such feeling, but a sensation of confusion, or of something rising from the throat or epigastrium to the head. In some cases there are no sensations in the head beyond the consciousness that something is wrong for a moment.

The sensations of petit mal are, moreover, usually sudden, or even flash-like, whereas in vertigo, cardiac syncope, and some hysterical attacks, there elapses quite a time in which the attack is growing. This suddenness of onset is very characteristic of minor epilepsy.

2. By objective phenomena. In faints and in some hysterical states the patient is limp from the start, and in other hysterical attacks there is spasm lasting many minutes. In petit mal there is nearly always spasm, but not as in grand mal. It usually expresses itself by a momentary rigidity of the whole body, with staring eyes and wide pupils. To express it otherwise, there is for an instant an unnatural immobility; the patient is, as it were, petrified for a few seconds. The friends of patients will usually accept the suggestion that the patient is statue-like in the attack.

It is to be borne in mind that in some cases the patient keeps his equilibrium, or even continues to walk. Nearly always, however, the action which the patient was doing at the moment (eating, talking, walking) is impeded or interrupted, to be resumed naturally after a few moments.

Some of these attacks of petit mal are literally like a flash,—just a moment's obscuration of consciousness. The consciousness is wholly lost in the various forms of petit mal,

though many patients will claim the contrary. The truth is usually easy to learn from the patient, or friends of the patient, and is at once evident if you happen to witness a paroxysm. I am in the habit of not relying upon an epileptic's statement that he is conscious during an attack, without sufficient corroborative testimony.

The dilatation of the pupils and their immobility, and the open state of the eyes, are capital symptoms.

In syncope and hysteria the eyes are closed and the muscles limber. The eyes in hysterical "faints" present an almost pathognomonic appearance; they are rather tightly closed, and present vibrations or quivering motions due to the prolonged effort at closure. In neither of these conditions is the pupil fixed and widely dilated, as in epilepsy: this is a symptom which cannot be imitated.

Vertigo from gastric disorder is characterized by a sense of whirling in the head, and often a sensation as if the ground were opening in front of the patient, or falling away from before him, with impending precipitation. The observer notices no dilatation of the pupils, or staring, or momentary stiffness of body; the patient can speak at any time. In severe cases the vertigo is very frequent and is produced by the least motion.

I cannot enter fully into a description, for diagnostic purposes, of each and every variety of petit mal. This would take a long time.

Allow me to refer to the intermediate attacks, in which there is some jerking of one of the limbs, or in which the patient says or does something odd. In some cases the patient will rise suddenly from a chair, walk rapidly about, muttering something. In other cases the patient will lie back in his chair with the epileptic facies, and jerk both arms or the limbs on one side of the body for a few moments. In other cases the patient, being out of doors walking in the street, loses himself for a few blocks, and is surprised at his change of location. In other cases there may be incoherent or semi-coherent talking. Other patients simply stare and make swallowing movements, with or without drooling. Other patients fumble and fuss about with their hands, while staring and unconscious.

The unconsciousness and the attendant pupillary phenomena are the chief diagnostic symptoms in these cases; but a very important element in the differential diagnosis between these attacks and hysterical ones is that the latter present variations each time, whereas the mixed epileptic seizure is almost a stereotyped performance, one or two sets of movements being done by the unconscious subject.

Still other cases of non-spasmodic epilepsy occur in the shape of periodic or paroxysmal attacks of mania or melancholia. In some of these cases the careful observer finds that a nocturnal fit or an unobserved diurnal paroxysm ushers in the psychosis; but in other cases the mental disorder appears in a periodic epileptoid manner, and convulsions or petit mal make their appearance later on.

I have already given it as my opinion, or rather as the summary of my experience, that petit mal is often ignored for years, and is usually looked upon as a trivial affection.

It is my present purpose to urge the early recognition and careful treatment of this seemingly insignificant symptom. It appears to parents, and too often to physicians, as infinitely less serious than grand mal or "fits;" yet I can assure you that the contrary is true.

Petit mal, especially the flash-like form, is exceedingly rebellious to treatment. I have now several little patients who continue to have several "turns" a day, despite the use of as much bromide, etc., as their systems will bear. I have repeatedly had to produce severe bromism in order to barely control these minor forms of epilepsy, and any reduction of the medicine to a safer dose was followed by a return of symptoms. In taking charge of a patient who has such petit mal I always explain to the parents or relatives the difficulty of the task they have brought to me. In my experience, spasmodic attacks—even the most severe fits—can nearly always be controlled by a proper dosing of the bromides,—they may also be suspended for months and years; but we have little control of the minor manifestations of the disease.

Still, in all forms of epilepsy the date of its recognition as epilepsy is an all-important factor in prognosis. By repeated seizures a condition of the nervous system (epileptic centre?) becomes established, which we designate as the epileptic habit, a condition which explains the remarkable fact that in some cases of symptomatic or reflex epilepsy the attacks continue after removal by surgical means of the morbid focus whence the attacks seem to be produced.

By instituting treatment very early, if possible after the first or second attack, we eliminate this factor, and the chances of cure are greatly increased.

EFFECTS OF DRUGS IN LACTATION.—Dr. Dolan, continuing (*Practitioner*, September, 1881) his series of articles on this subject, from which we have already quoted, gives a case where fifteen grains of *chloral* were given to a patient every few hours before confinement, until seventy-five grains had been taken. No trace of chloral was found in the milk on the third day; but Dr. Dolan thinks chloral does have an effect on the milk.

Calabar bean has been suggested as a means of restoring the suppressed secretion of milk. Dr. Dolan tried this remedy, but without effect on the flow of the milk.

Cod-liver oil was given to two nursing women in the dose of one tablespoonful three times a day in a cup of warm milk. The

children nursed as usual, and no physiological effect was produced on them. Linseed tea, beef fat, and mutton fat were administered to women with the view of ascertaining what, if any, effect would be produced upon the amount of breast-milk secreted. In two cases no effect was produced.

Castor oil was given to mothers in a number of cases. It always produced a purgative action on the child.

Of *cummin*, as of the other aromatics, Dr. Dolan says, "I believe that I may formulate the law that they all impart a flavor and odor to human milk, without increasing the quantity or improving the quality of the secretion."

Of *conium* he remarks, "Most of the Umbelliferæ are readily absorbed by the lacteal vessels, and may be easily found in the milk. Conium, from its sedative action and its influence on the nerves of motion, could not be expected to increase the milk-supply. There are reasons, however, for its administration to mothers who are nursing, so that it is important to note how soon, if at all, it appears in the milk, and what dose produces an effect. Conium, praised by Störck for the cure of uterine scirrhus, and by Dr. Tunstall for chronic inflammation of the womb, is an excellent sedative for back-ache and for the sexual organs. It must be given until its physiological effects are produced, and this means a dose of the succus conii B. P. of two or three drachms."

He administered two-drachm doses of the succus conii every three hours to a patient until she had taken twelve drachms. Analysis of the milk then showed the absence of conium.

Digitalis infusion, in half-ounce doses every six hours, was given in three cases without any trace of the medicine being found in the milk.

Regarding *ergot*, Dr. Dolan says his results are negative or uncertain. Two grains every two hours were given to a nursing mother until twelve grains had been administered. The mother thought the child was affected, as it was cross and irritable. No ergot could be found in the milk, although it must be admitted that our present methods of analysis are unsatisfactory.

Of *iodide of potassium* Dr. Dolan says that in his experience it does not decrease the quantity of milk, although its prolonged use may deteriorate the milk by impoverishing the blood. He found iodine in the milk of a patient who had taken fifteen grains of iodide of potassium every three hours until sixty grains had been taken. A child eighteen months old, who had been given the milk from a woman taking iodide of potassium, showed iodine in the urine.

Of *mercury* Dr. Dolan's experience is inconclusive. In the two cases examined, no trace of mercury was found in the milk.

Opium, when given to the nursing mother in large doses, can be found in the milk. After small doses it cannot be detected.

Phosphorus was given to two nursing women in doses of one-thirtieth of a grain for fourteen days without any trace of the drug being found in milk or urine. The *potash salts* and *quinine* do not, in Dr. Dolan's experience, pass into the milk. *Rhubarb* and *senna*, however, do, and produce their physiological effect on the nursing child. *Sulphur* and *turpentine*, administered internally, affected the milk, the former acting as a mild purgative on the nursing infant. *Valerian*, *dill*, and *copaiba* are also excreted by the milk.

THE HIGH OPERATION FOR STONE.—In the reports of the Société Anatomique, M. Guyon presents an interesting case of the high operation for stone. The patient, 61 years of age, had suffered from urinary troubles. The almost constant pain in the vicinity of the bladder and genitalia was greatly augmented by walking or riding. During two years before the operation a continuous desire to urinate harassed the patient. The examination of the bladder with the catheter was difficult, since it bore but little manipulation, and the procedure was followed by urethral hemorrhage. Nevertheless, the presence of a large calculus was ascertained and confirmed by the rectal touch. A second examination revealed the stone to be of such size as to preclude the possibility of its removal by the ordinary lateral operation: thereupon it was determined to resort to the high operation. A large silver catheter, grooved on its concave surface, was introduced into the bladder and about two ounces of fluid injected. The incision in the median line commenced at the superior margin of the pubes and was continued about four inches upward. Layer after layer was divided while an assistant retained with his finger the peritoneal fold and intestine in position in the upper angle of the wound. Since the calculus completely filled its cavity, the wall of the bladder could not be pressed into the incision according to the usual method by pressure on the catheter. Hence the bladder was incised directly over the stone, and the latter removed with forceps. Deep and superficial sutures were then passed, a space of little over an inch being left below for the passage of a rubber catheter. The dimensions of the stone are as follows: length, nine cm. (three and one-half inches), width, seven cm., and thickness, five cm. From the time of the operation gradually increasing fever supervened, and the patient died on the sixth day after the operation.—*Progrès Médical*, April 16, 1881.

Nicoladoni likewise reports two high operations for stone, in which all the antiseptic precautions were taken.

The first patient was a girl, 5 years of age, in whom a stone of urates and phosphates completely filled the bladder and projected

into the urethra and a diverticulum of the bladder. The stone was removed by the high operation, the incision being an inch and one-half in length. Owing to the bruising of the vesical wall and the margin of the incision into the bladder, a suture was not made. A flexible catheter was introduced into the bladder and allowed to protrude from the urethra and abdominal wound. To the latter the antiseptic dressing was applied. Although the patient did well during eight days, death resulted from uræmia on the tenth day after the operation.

In the second case, of a boy aged 5½ years, the stone, which consisted of urates, could easily be removed through an incision a little over an inch in length without bruising the margins of the wound. In this case five sutures with carbolized silk were introduced to close the vesical wound, and the abdominal incision was then closed. The union was perfect, urine at no time escaping through the abdominal wound.—*Wien. Med. Presse*, 14, 15; *Cincinnati Lancet and Clinic.*

Clinical Urology.—M. Robin reported to the Society of Biology in Paris two cases in which the patients suffered from diseases whose differential diagnosis, though very difficult by the ordinary means, was yet rendered easy by an examination of the urine. The first case was that of a boy aged 15, who presented obscure typhoid symptoms; the second was a patient of the same age, with almost identical symptoms, except that in the latter case there was slight hyperæsthesia and a slow pulse. In the second case there was reason to suppose that the patient might be suffering from tubercular meningitis. Examination of the urine resulted in the following observations. In the first case it was turbid, with a specific gravity of 1.013, and a slight excess of urea and uric acid was present. Nitric acid poured down the side of the test-tube containing the urine caused a number of superimposed zones to form in the following order: a stratum of uric acid, a transparent zone; a stratum of albumen, and underneath a blue ring due to the presence of indican. In the case of the second patient the urine had a reddish tinge, was clear, with a sp. gr. of 1.032, and contained a very considerable quantity of urea; neither albumen nor indican was detected on the addition of nitric acid, but urohæmatin was shown to be present. From this difference in the urine M. Robin diagnosed typhoid fever in the one case and tubercular meningitis in the other, and post-mortem examination verified in each case the diagnosis. M. Robin states that this difference in the urine exists in all the cases which he has hitherto examined. In typhoid fever indican and albumen are always present, but only very rarely urohæmatin. The latter substance, however, is sometimes present at the beginning of continued fever under certain conditions, such as pulmonary complications, hemorrhage, facial erysipelas, or when the disease attacks a very robust individual and assumes an inflammatory type. M. Robin concluded his remarks by stating that the presence of indican in urine affords a very valuable diagnostic sign of typhoid fever; for although we cannot say that the patient is free from the fever because the coloration is absent, yet when it is seen in the urine he must be said to be suffering from typhoid.—*Le Progrès Médical; Practitioner*, 1881, p. 213.

Lupus of the Larynx and Pharynx.—In an article on this affection (*Archives of Laryngology*, 1881, p. 250) Dr. Morris J. Asch concludes as follows:

"1. Lupus of the mucous membrane may and does exist independent of any cutaneous sign of the disease.

"2. In cases where the disease exists only in the throat, it shows itself first usually in the velum, while its extension to the larynx is rare.

"3. While its diagnosis is difficult, yet careful study of the case in all its bearings will enable us to distinguish it from syphilis.

"4. Treatment affords some reasonable hope of cure, and its prognosis is not altogether hopeless."

Alopecia of the Eyebrow.—In certain cases syphilitic alopecia destroys the beard, the eyebrow, and all hair-covered portions of the body. Alopecia of the eyebrow is a symptom which should at once put the physician upon the trail of diagnosing syphilis. It acts precisely as it does upon the head,—that is, sometimes it renders the eyebrow thin, sometimes removes the hair completely to a greater or less extent. When the eyebrow is discovered broken by a bald line, this single symptom is almost pathognomonic of syphilis. For the baldness which often attacks the brow proceeds differently and denudes entirely the superciliary region.—*Journal de Méd. et Chirurg.*

A Cure for Singultus.—*Le Scalpel* (December 5, 1880) gives a very easy cure for a continued singultus, sometimes complicated with spasm of the glottis, introduced by Rostau and highly recommended by Deghillaye of Mons. It consists in placing the hand flat upon the epigastrium, immediately below the ensiform cartilage, and making firm pressure. Should this prove unsuccessful, place a firm roll of muslin on the same place, securing it by a napkin bound firmly around. In an hour this may be removed, and it will be found that the hiccough has entirely disappeared.—*Cincinnati Lancet and Clinic.*

Purgatives by Hypodermic Injection.—It has been found (*Paris Médical*) that hypodermic injections of aloin (the alkaloid of Socotrine aloes) will cause purgation when used in doses of one-twenty-fifth of a grain. We can thus, by combining apomorphia and aloin, produce an action each way without having to introduce anything into the stomach.

MISCELLANY.

REACTION FOR DISTINGUISHING THE PTOMAINES FROM THE VEGETABLE ALKALOIDS (P. Brouardel and E. Boutmy).—If a substance isolated by the method of Stas behaves with potassium iodo-mercurate as do the vegetable alkaloids, and if it has no action on potassium ferricyanide, a vegetable alkaloid is present. If the ferricyanide is reduced to ferrocyanide, whilst the base is also precipitated by an iodo-mercurate, it is a ptomaine. In applying the test, the base extracted from the body under examination is converted into a sulphate, and a few drops of the solution of this salt are placed in a watch-glass which already contains a little ferricyanide dissolved. A drop of neutral ferric chloride added to the mixture gives a precipitate of Prussian blue if the base isolated is a ptomaine. *Ptomaine* is a generic term employed to designate the peculiar poisonous alkaloids discovered by F. Selmi in human bodies after death. Armand Gautier, in commenting upon the reaction described above, states that while indeed no naturally occurring alkaloids have been found to give the above reaction of ptomaines, yet there are many artificial compounds which react in the same manner. Among them are phenylic bases, as aniline, methyl aniline, paratoluidine, diphenylamine; pyridine bases and bodies like diallylenediamine and acetonamine. Nevertheless the reaction is important as affording an additional criterion in doubtful cases.—*Répert. de Pharm.*, 1881, 276, 278; *New Remedies.*

HARD ON THE SPECIALISTS.—At a recent meeting of the Canada Medical Association the following resolutions were introduced:

"*Whereas*, The system of specialism and specialists, which at present obtains to a certain extent in the Dominion, and which has developed to a very large proportion in the neighboring republic, is for the most part the outgrowth of superficial professional education and want of success as practitioners of medicine and surgery,

"*Therefore, Resolved*, That it is the opinion of this Society that specialism should be discountenanced by the members of this Society, and that specialists should be treated and looked upon as irregular practitioners, except in rare cases, where long experience, extended study, and peculiar aptitude have placed a medical man in a special position towards his brethren;

"*Be it therefore Resolved*, That the members of this Society pledge themselves to do all in their power to check the growth of this species of evil."

In supporting his resolution, Dr. Slayter said the evil complained of was ruining the profession in America, and must be stopped if they ever expected to come up to the European standard.

WELL RID OF IT.—A recent writer on scorbutus says that this disease is gradually dying out in all civilized countries. Russia is now its chief seat, and in particular St. Petersburg.

OFFICIAL LIST

OF CHANGES OF STATIONS AND DUTIES OF OFFICERS OF THE MEDICAL DEPARTMENT U.S. ARMY FROM OCTOBER 2 TO OCTOBER 15, 1881.

MURRAY, ROBERT, COLONEL AND SURGEON, MEDICAL DIRECTOR MILITARY DIVISION OF THE MISSOURI.—Granted leave of absence for two months. S. O. 100, Military Division of the Missouri, October 5, 1881.

MAGRUDER, D. L., MAJOR AND SURGEON, MEDICAL DIRECTOR DEPARTMENT OF THE MISSOURI.—Granted leave of absence for one month. S. O. 207, Department of the Missouri, October 11, 1881.

BYRNE, C. C., MAJOR AND SURGEON.—Relieved from duty at Wilcox, A.T., to proceed to Camp Thomas, A.T., and report to the Commanding Officer for duty in the field. Field Orders No. 4, Headquarters Department of Arizona in the Field, September 9, 1881.

WOODHULL, A. A., MAJOR AND SURGEON.—Granted leave of absence for four months. S. O. 227, A. G. O., October 7, 1881.

JAQUETT, G. P., MAJOR AND SURGEON.—Granted leave of absence for one month. S. O. 231, A. G. O., October 12, 1881.

CLEARY, P. J. A., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for six months on surgeon's certificate of disability, with permission to apply for six months' extension if necessary. S. O. 224, A. G. O., October 4, 1881.

KOERPER, E. A., CAPTAIN AND ASSISTANT-SURGEON.—Assigned to duty at Plattsburg Barracks, N.Y., as Post-Surgeon. S. O. 180, Department of the East, October 7, 1881.

CORSON, J. K., CAPTAIN AND ASSISTANT-SURGEON.—Confirms telegraphic instructions of this date, directing him to report to the Commanding Officer Battalion Fourth Artillery at Fort Yuma, California. S. O. 114, Department of Arizona, October 5, 1881.

KING, WM. H., CAPTAIN AND ASSISTANT-SURGEON.—To proceed without delay to Fort Trumbull, Conn., and report to the Commanding Officer for temporary duty. S. O. 176, Department of the East, October 3, 1881.

O'REILLY, R. M., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for six months from December 1, 1881, on surgeon's certificate of disability. S. O. 225, A. G. O., October 5, 1881.

HARVEY, P. F., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for twenty-five days, to take effect on adjournment of the G. C. M., of which he is a member. S. O. 162, Department of Dakota, October 5, 1881.

COWDREY, S. G., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for four months. S. O. 228, A. G. O., October 8, 1881.

MAUS, L. M., CAPTAIN AND ASSISTANT-SURGEON.—Granted leave of absence for four months. S. O. 222, c. s., A. G. O.

APPEL, D. M., CAPTAIN AND ASSISTANT-SURGEON.—Relieved from duty at Fort Supply, I.T., and assigned to duty at Fort Elliott, Texas. S. O. 201, Department of the Missouri, October 4, 1881.

ROBINSON, S. Q., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—Granted leave of absence for four months. S. O. 228, A. G. O., October 8, 1881.

STRONG, N., FIRST-LIEUTENANT AND ASSISTANT-SURGEON.—When relieved by Assistant-Surgeon Shannon from duty at Fort Thornburgh, U.T., assigned to temporary duty with troops repairing road between Park City and Fort Thornburgh, U.T. S. O. 102, Department of the Platte, October 4, 1881.